

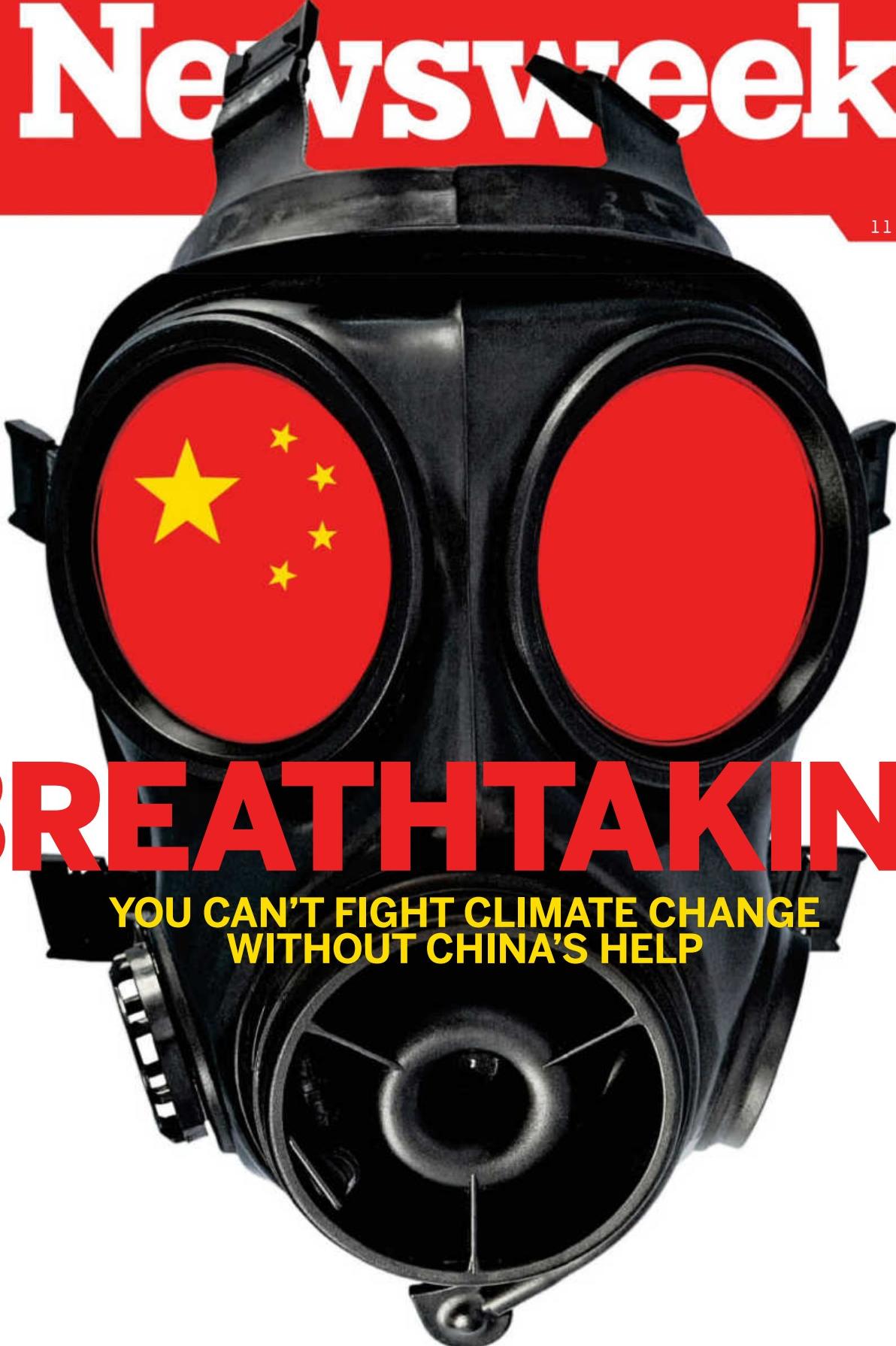
What ISIS Wants / Cuba, Cows and Capitalism

# Newsweek®

11.12.2015

## BREATHTAKING

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**Full of surprises.**

# Newsweek

DECEMBER 11, 2015 / VOL. 165 / NO. 21



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Concern about pollution is finally pushing China to act on climate change. Slowly. *by Bill Powell*

### 30 When the Cows Come Home

From toothpaste to toilet paper, shortages are common in Cuba. But as the country warms to capitalism—and the U.S.—that may change. A prime example: beef.

*by Taylor Wofford*

COVER CREDIT: PHOTOGRAPH BY SUMOGRAFIKA/GETTY

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+  
**HORSING AROUND:**  
In the Cuban countryside, horses are still used as a popular form of transportation. Little has changed in the island nation since the U.S. implemented a trade embargo in the 1960s.

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A dramatic portrait of Chris Hemsworth. He has blonde hair and blue eyes, looking intensely at the viewer. He is wearing a dark blue suit jacket over a white shirt. His right hand is raised, pointing his index finger directly at the camera. The background is dark and moody with some blurred lights.

#DontCrackUnderPressure



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**TAG HEUER CARRERA CALIBRE HEUER 01**

Chris Hemsworth works hard and chooses his roles carefully. He handles pressure by taming it, and turning it to his advantage. #DontCrackUnderPressure was coined with him in mind.



TURKISH CHIEF OF STAFF/REUTERS



BIG  
SHOTS

TURKEY

## Honor Guard

Ankara, Turkey—Turkish soldiers carry the coffin of a Russian pilot, who was killed when Turkey shot down his jet, to a Russian aircraft at Esenboga Airport on November 30. Turkey says it shot down the Su-24 fighter jet after it violated Turkish airspace on November 24 and ignored numerous warnings to turn back. Russia, however, says the jet never crossed into Turkish territory and called the incident “a stab in the back.” Both Turkish President Recep Tayyip Erdogan and Russian President Vladimir Putin have refused to apologize.

U.S.A.

## Big Brother

Chicago—A protester confronts a police officer in downtown Chicago on November 25 after the release of a dashcam video showing Chicago police officer Jason Van Dyke shooting to death Laquan McDonald, a black 17-year-old, as he was walking away from police. It took a year and a public records request for the video to be released.

Van Dyke, who is white, was charged with first-degree murder the day before the footage was made public.

MAX HERMAN





MAX HERMAN/DEMOTIX/CORBIS



CENTRAL  
AFRICAN REPUBLIC

## Brothers and Sisters

Bangui, Central African Republic—Pope Francis waves to a crowd en route to the Central Mosque of Koudoukou on November 30, on the final day of his African tour. A two-year civil war has divided the country along mostly religious lines and killed more than 6,000 people. Under the watch of U.N. peacekeepers, the pope bowed toward Islam's holy city of Mecca and sat next to the mosque's chief imam to pray. "Christians and Muslims are brothers and sisters," he said. "Together, we must say no to hatred...perpetrated in the name of a religion or of God himself."

=====  
 JEROME DELAY

BIG SHOTS

U.S.A.

## Pro Life?

Colorado Springs, Colorado—Robert Lewis Dear Jr. is taken into custody outside a Planned Parenthood clinic on November 27. Dear is accused of killing three people, including a police officer, and injuring nine more when he opened fire and barricaded himself in the clinic. Although investigators have not stated a motive, comments Dear is reported to have made during his arrest indicated he may have been motivated by anti-abortion rhetoric.



ISAIAH J. DOWNING





ISAIAH J. DOWLING/REUTERS



# PAGE ONE

EGYPT

ISIS

TURKEY

POLITICS

RUSSIA

SYRIA

THE SCOOP

## KNOW THY TERRORIST

Scorning the refugees from Syria is doing ISIS a huge favor

**THEY ARE CONVINCED** the world is reaching End Times, the apocalypse foretold in Scripture. They believe Jesus the Messiah will then return to join the faithful in a battle against the antichrist. The glorious confrontation will be won, with Jesus and his followers reigning supreme after the defeat of evil.

And who are these believers? No, not evangelical Christians—they're the members of ISIS.

If that's surprising, it reflects the general lack of understanding about this group. That Jesus will return in humanity's last days is a tenet of fundamentalist Islam and is a driving force behind some of ISIS's decisions. Unfortunately, many Americans have fallen prey to the idea that studying the enemy is a sign of placation or weakness. Too many people—led by disingenuous or ignorant politicians—take pride in their refusal to make the militarily essential decision to learn about the extremists.

That is not analysis from armchair warriors. The importance of learning about the adversary is accepted military strategy, included in *The Art of War*, the ancient Chinese treatise on

combat attributed to a general named Sun Tzu. The book is considered so important to warfare tactics that it is required reading for all CIA officers and is taught at every American military academy. It states, "If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat."

When it comes to ISIS, our failure to understand the enemy is clear in the fumbling, self-defeating way the United States has handled the problem of Syrian refugees fleeing the violence inflicted by militants and the government of Bashar al-Assad. Driven by fearmongering primarily pushed by Republican governors and presidential candidates, Americans are frightened that terrorists might hide among refugees brought into the country. This is a nonsensical construct built on ignorance; ISIS does not need refugees to infiltrate the West. Thanks to its relentless propaganda on social media that is aided by ignorant American politicians, ISIS has recruited thousands of residents in Europe and a few dozen in the United

BY

KURT EICHENWALD  
 @kurteichenwald



MARK PETERSON/REDUX

+  
**THIS CRUSADE  
WILL BE TELEVISED:**  
Making the fight  
against ISIS a war  
against Islam helps  
the enemy and  
alienates millions  
of potential allies.

States, according to the CIA. And they, obviously, do not need to pose as refugees.

"It is true that ISIS could exploit the crisis to insert operatives into Europe," according to Aaron Zelin of the Washington Institute for Near East Policy. "At the same time, however, one must remember that the group already has thousands of members with European Union passports and has very good document forgers. Therefore, the sole reason for nesting additional operatives in the refugee flows would be to spark a backlash against Syrian and other refugees as well as the native Muslim populations."

So the extremists have easier ways to enter the United States than by posing as refugees. This is important to consider because by keeping refugees out, American politicians are aiding and abetting ISIS (and accomplishing nothing). Ironically, the flow of Syrians away from Islamic countries infuriates the group, since it undermines ISIS's claim that it is forming an Islamic empire that will protect devout Muslims. Essentially, every Syrian family that takes the dangerous trip to other countries communicates to Muslims worldwide that they would rather risk death than remain near ISIS.

In response, the group has released at least 12 videos attempting to persuade Syrians to stay put. The videos warn Syrians fleeing to the West that they will be forced to convert to Christianity—a claim they back up with reckless statements by Western politicians and commentators. Spokesmen on the videos say Westerners will attack Syrians, then they show film clips of police beating refugees in Europe. They say refugees will be treated with contempt, and they have lots of evidence backing up that charge.

In other words, those in America and its Western allies who refuse safe haven to Syrian refugees out of misplaced fear that terrorists might slip in alongside them are doing ISIS's work. "The refugee baiters, their rhetoric and their proposed policies will lead to self-fulfilling ends and make everyone less safe," Zelin says.

Ignorance of ISIS is also driving calls for simplistic military solutions. This relates to the group's belief in the End Times. In 2014, ISIS waged a bitter fight against other Sunni Muslims to gain control

of Dabiq, a Syrian town of no strategic significance. Yet it is there, according to an Islamic prophecy, that the battle against the antichrist will be fought. And now, as more countries join the fight against ISIS, its members cheer—believing the prophecy that 80 flags (nations) will gather in Dabiq to wage war, with Jesus leading Muslims to victory is coming even closer.

The Antichrist in this battle is a liar with one eye, and some followers of ISIS believe they know his identity. The indispensable book *The ISIS Apocalypse* by William McCants of the Brookings Institution quotes a tweet by an ISIS acolyte following the attack on the *Charlie Hebdo* newspaper office in Paris that proclaimed: "The West is the one-eyed deceiver."

Why is this important? Because it tells us ISIS fighters will not run from a military confrontation; they crave it. Its members do not fear death in battle; they pray for it. American politicians who proclaim they will terrify ISIS with their commitment to fight do not understand what motivates the enemy. Saying, "We will look for you, we will find you, and we will

**HEARTS AND MINES:** General James Terry, who's running the U.S. military operation in Syria, knows that propaganda is one of ISIS's most potent weapons.

+



MARK WILSON/GETTY



"kill you," as Marco Rubio did in May, might satisfy tough-guy emotional impulses (his words are plural versions of sentences straight out of the action movie *Taken*), but they are promises that bring joy, not fear, to ISIS fighters. Calling for the bombing of refineries, as Donald Trump wants, accomplishes nothing; putting boots on the ground in Iraq, as Jeb Bush and Ben Carson have demanded, would drive away the Iranians fighting there while leaving ISIS's primary stronghold in Syria untouched. Of course, this does not mean the West should abandon military strategies; the American-led campaign called Operation Inherent Resolve has shown effectiveness in driving back ISIS. What is clear, though, is that politicians who build their strategies under the belief that Sunni fighters can be frightened by promising more bombs and troops are as deluded now as they were when America invaded Iraq in 2003.

Fortunately, even if the politicians do not understand ISIS, military strategists do. In 2014, government strategists from more than 30 countries gathered at MacDill Air Force Base. There, according to two military officers who attended, the group engaged in "red teaming," which involves anticipating what the enemy will do. The issue of the End Times was discussed, as was the fact that the prospect of death would not frighten ISIS fighters.

The strategists also assessed ISIS's strengths and weaknesses. Two are important here. One limitation is that ISIS has no real allies among Arab powers—even Al-Qaeda is an enemy. That is why it engages in grotesque barbarity against Syrian and Iraqi Muslims; ISIS wants to force people to choose sides. Join them and enjoy their protection, reject them and die a horrible death.

The strategists at MacDill concluded that ISIS's strength comes from persuading Muslims worldwide, particularly in Europe, that the West wants to destroy Islam. Unfortunately, many politicians seem determined to reinforce that message here.

For example, the argument that Islam is a religion of pure violence is idiocy. (For those who point to the brutality in portions of the Koran as "proof" that all Muslims are violent, read the Old Testament; slaughter and torture in Scripture are commonplace.) According to the CIA, ISIS fighters are just 0.002 percent of the world's Muslims, slightly more than 30,000 people. To give a sense of scale, a greater

percentage of Americans showed up this past August in Carver, Oregon, to bob on rubber rafts down the Clackamas River for the Big Float 2015 celebration.

There are, however, Muslims who, while not yet violent, are open to claims that the West is engaged in a battle against Islam. When knuckleheads march with assault rifles outside of American mosques, ISIS tweets the news as proof that the West wants to destroy their religion. When Trump proclaims American Muslims should wear badges, there is dancing at ISIS camps as militants spread the word across the Internet. When Republican politicians demand that President Barack Obama say America is fighting "radical Islam," ISIS cheers; the term is avoided not

## FOR THOSE WHO POINT TO THE BRUTALITY IN PORTIONS OF THE KORAN AS "PROOF" THAT ALL MUSLIMS ARE VIOLENT, READ THE OLD TESTAMENT.

for political correctness but because it is considered a *compliment* among fundamentalist Muslims. In other words, bandying about the term makes ISIS more attractive to Muslims who are on the fence about whether to join.

So America and its political leaders have to decide: Will they continue to condemn as weak those officials who attempt to comprehend ISIS? Will they allow fear to strengthen the enemy? Will they keep trying to insult jihadis by calling them practitioners of radical Islam, even though doing so delights and strengthens the enemy?

It is more important to *be* tough than to *sound* tough. That lesson, combined with greater amounts of courage and humanity by America's leaders and its citizens, is the prescription for victory against this zealous foe. ■

## LAST STOP ON THE CAMEL TRAIN

# Egyptians don't like camel meat anymore, and climate change could be the last straw

**FOR OVER A WEEK** now, Ahmed Awani has struggled to offload any of the "prime" cuts of camel haunch that dangle on bloodied hooks outside his Cairo butcher's stall. He's tried a few gimmicks—"Buy 5 kilos of meat and receive a free pigeon." He's careful to beat off the flies that swarm his alleyway in the intense late summer heat. "You need to keep it looking clean," Awani says, while sprinkling the skinned carcasses with water as passing motorized rickshaws kick up clouds of dust.

But on this day, like most others before it, residents of the working-class Darb al-Ahmar neighborhood in the city's historic core won't bite. They have little appetite for Awani's wares—most of the camels are castoffs from the Giza pyramids tours that were no longer strong enough to bear the weight of camera-laden travelers—and so, after 25 years of plying his trade, the aging butcher is slowly resigning himself to reworking his stock. "People here used to savor camels in the same way as Christians love wine," he says wistfully, hacking the last edible scraps off a butchered sheep in preparation for the Muslim holiday of Eid el-Adha. "Not anymore, though. Now it's all chicken, chicken chicken, chicken, chicken."

Ever since the earliest days of Nile civilization, camels and their meat have been a fixture of Egyptian and Sudanese life. From hauling heavy sacks of grain to market to providing a welcome high-protein treat for laborers, the hardy animals have sustained commerce and rural communities for millennia.

But as millions of villagers flock to urban areas, these big beasts have become less popular. "Ew," or some variation of it, is the standard response when a dozen residents of Cairo and Assiut, a city to the capital's south, are asked for their thoughts on the strong, tangy flavor of camel meat. "It's only good for *kofta*

All this spells serious trouble for the farmers, dealers and shepherds who make their living along the storied camel caravan routes that extend from the Sudanese hinterland to the Nile Delta's densely populated wetlands. Their profit margins have been thin since a ban on slavery was first enforced a little over 100 years ago. (Human cargo sometimes subsidized the camel industry.) "God knows it's never been easy," says Alameen Hammad, a herder at the buzzy livestock market in Dongola, Sudan, as he readies his 70-strong pack of camels for the short, but ferociously hot, hop across the northern Sudanese desert to the Egyptian customs post alongside Lake Nasser. "Even when I began 30 years ago, it was difficult. But not like this. This is brutal." After losing two camels to masked robbers near his hometown of El Obeid, Sudan, his chances of recouping his family's investment are low. He has taken to watering his charges once every other day in order to save on expenses.

Looking out over this sprawling bazaar, which stands less than a mile from the Nile, it might appear as if the camel trade is thriving. Over

BY  
**PETER SCHWARTZSTEIN**  
 @PSchwartzstein



**OVER THE HUMP:**  
Traders from as far  
away as Somalia  
and Sudan bring  
their camels to the  
market in Birqash,  
near Cairo.

2,000 grunting, spitting creatures straggle across the scrubland on the edge of the Sahara, periodically lashing out at nearby people and protesting furiously as they're loaded onto trucks.

But part of Hammad and his counterparts' problem is that spiraling costs have pushed the price of camels beyond the reach of many of those who still care to eat them. At nearly \$4 a pound in southern Egypt—compared with just a few cents a pound a few decades ago—it's more expensive here than beef. With about 40 percent of Egyptians earning less than \$2 a day, meat of any kind is a luxury for many.

Mostafa Hassan Ibrahim, the self-described “wealthiest man” at the camel market in Daraw, Egypt, which is just to the north of Aswan, says there are many reasons for the sky-high price of camel meat. Both Cairo and Khartoum have taxed the trade to death, he says, often collectively demanding up to \$250 per animal sold. Violence and instability in Sudan, where seven of its 18 states are at war, including camel-heavy Darfur and South Kordofan, have also exacted a serious toll. “And then there’s the food, the water, the gas. All these things just get more and more expensive,” Ibrahim says, pausing to listen in on a furious haggle, before swiftly darting to the side as a pack of camels, their right forelegs bound, hurtle toward us.

Above all, though, it appears the camel trade has fallen victim to climate change. A severe reduction in rainfall has shrunk grazing lands in Sudan by up to 50 percent, according to the U.N. Environment Program, while desertification has covered many watering holes. “The distances between a lot of the oases are just too great now,” says Mohammed Ahmed Riad, a hardware merchant, who deals in the chains and iron brands

used by camel herders at Daraw. “In a lot of places they now have to go by truck, which is expensive. Everything’s just going wrong.”

Poor conditions in the camel-rearing heartlands appear to have inspired an uptake in inter-tribal rivalries, as struggling clans compete for scant resources. Hammad says members of the Darfuri Rizeigat tribe, who dominate Dongola’s market, are renowned thieves and have stepped up their camel rustling. “They use the *haboob* [sandstorms] as cover,” he says. Rival dealers insist Hammad’s Kababish tribe has a reputation for double-dealing and trading in stolen goods.

Whatever the truth is, it’s clear that the several-thousand-year-old camel industry is close to extinction. If it were to disappear, Awni

## “PEOPLE HERE USED TO SAVOR CAMELS IN THE SAME WAY AS CHRISTIANS LOVE WINE.”



**CHEW ON THAT:**  
After a lifetime of carrying tourists, many camels end up at the butcher shop. But most Egyptians think camel meat is good only for kofta—meatballs.

feels the region would lose part of its soul. As the Cairo butcher puts it, “When you hear Egypt, you think camels, no?” □

This article was made possible by support from the Pulitzer Center for Crisis Reporting.



## The Hippocratic Death Warrant

SYRIAN GOVERNMENT FORCES ARE TARGETING DOCTORS AS A WEAPON OF WAR

The number of doctors in Syria's rebel-held eastern Aleppo has been reduced to no more than 80, as the vast majority have been killed or fled, according to nonprofit Physicians for Human Rights.

The city is divided into two sections, with rebels of various factions controlling the east and government forces holding the west. Physicians for Human Rights produced a report on the eastern part of the city, where it said the population has fallen from around 1.2 million in 2010 to around 300,000 since the war broke out in 2011. (The total prewar population

of Aleppo was more than 2 million, making it Syria's largest city.) In 2010, 1,500 doctors were working in eastern Aleppo. Now 80 doctors, at most, are still working, but the actual number at any given moment is between 37 and 50, as these doctors regularly take time off to rest in Turkey and elsewhere after working for days on end in crisis conditions.

The report said around 95 percent of Aleppo's doctors have been killed, detained or have fled. That means there's now roughly one doctor for every 7,000 people in eastern Aleppo, com-

pared with one doctor for every 800 people in 2010. The number of specialists has dwindled, leaving just one cardiologist, one neurologist, one female gynecologist and one or two urologists. Doctors who remain are mostly treating acute injuries, and many are learning on the job, having had little experience before the war in performing amputations or surgeries. Doctors interviewed by Physicians for Human Rights said they live in constant fear of aerial bombardment. Around 200 nurses are thought to be still working with the remaining doctors.

Government forces have attacked 45 hospitals in the past four years, according to Physicians for Human Rights. Since March 2011, 687 health care workers have been killed in Syria, and nearly 300 medical facilities have been destroyed. "We see this as a terrifying precedent for what could indeed be a very effective weapon of war," says Michele Heisler, co-author of the report. "Once you start targeting hospitals so people can't give or receive medical care, it is an insidiously effective way of sowing terror."

BY  
LUCY WESTCOTT  
 @lvzwestcott

SOURCE: PHYSICIANS FOR HUMAN RIGHTS

## Are You Inexperienced?

MILITARY CHALLENGES LIKE ISIS USUALLY HELP SEASONED CANDIDATES, BUT THE REPUBLICAN CAMPAIGN ISN'T PLAYING OUT THAT WAY

"ALWAYS IN political campaigns there's this emphasis on new," New Jersey Governor Chris Christie lamented in a speech to the Council on Foreign Relations on November 24. "New can be wonderful. It's shiny, it's perfect, it's untouched. But it's untested," the two-term governor and former federal prosecutor said. "New seems fabulous, until the moment comes when you need experience."

Christie and the more experienced Republican presidential candidates hope that moment is now. Lagging in the polls, they seek a resurgence after the Paris attacks. Conventional wisdom holds that when security is at stake, voters gravitate toward the adult in the room, and Christie, former Florida Governor Jeb Bush and Ohio Governor John Kasich are eager to show they're the grown-ups.

But as has been the case so many times this year, the American electorate is defying expectations. The Paris attacks are clearly on the minds of GOP voters. A *Boston Globe*-Suffolk University poll of New Hampshire



Republicans found a large plurality—42 percent—rated terrorism and national security as the No. 1 issue facing the country, far outpacing the usual answer: the economy.

The problem for the self-professed adults? Granite State voters rated Donald Trump as the candidate "best equipped to handle the American response to the Islamic State," despite his unsubstantiated claim that thousands of Muslims in New Jersey cheered the fall of the twin towers and his controversial call to bring back waterboarding.

His rationale—"even if it didn't work, they deserved it"—seems to be in sync with the belligerent mood of many voters.

Three-quarters of Republican voters in Iowa support sending ground troops to fight ISIS, according to a new

CBS News-YouGov poll. And 49 percent agreed that Trump is ready to be commander in chief, trailing only first-term Senators Marco Rubio and Ted Cruz.

"Less than one term in the United States Senate has proven to be woeful training, woeful training, for the Oval Office," Christie said in his foreign policy speech, a shot at not just President Barack Obama but also Republican rivals Rubio, Cruz and Kentucky Senator Rand Paul. But it's the adults who are woefully behind.

Christie's remarks follow similar speeches from Bush and Kasich. Like Christie, they emphasized their own résumés and offered few specifics on what it will take to tackle ISIS. Meanwhile, their allies are getting behind a \$2.5 million ad campaign

launched by the pro-Kasich super PAC, New Day for America, hitting Trump for his lack of experience. Last month, it even hired a plane to circle Ohio's Columbus Convention Center, where Trump was speaking, pulling a banner that read, "Ohioans can't trust Trump."

So far, no gimmick has boosted the political veterans. The *Globe* poll has Bush, Kasich and Christie mired in single digits in New Hampshire, the early state that's a must-win for establishment candidates. In Iowa, where retired neurosurgeon Ben Carson was leading but is now slipping, it's Cruz—a senator less than three years—who has risen, not Bush. Even on national security, it's anger, not ability, that seems to be driving the 2016 campaign. ☐

+  
FLIPPED HIS  
LID: Trump, who  
has never held  
public office,  
is getting the  
biggest surge  
post-Paris.

BY  
**EMILY CADEI**  
 @emilycadei

## Names in the News

UP, DOWN AND SIDEWAYS

 @WisdomWatch



### JEFF BEZOS

 Amazon CEO manages to launch rocket and land it safely, so that it can be used again. Bezos hopes to make civilian space travel affordable with his Blue Origin company, which has released video of said reusable rocket taking off. Rival Elon Musk of SpaceX claims J.J. Abrams helped fake the footage.

### TALL, DARK STRANGER

 Japan's "phenomenally handsome gorilla" gets star treatment with wide-release DVD *Shabani, the Gorilla Who's Just Too Hot*. ABC hoping to sign him for *Dancing With the Stars*.



### COOL CHICKS

 Englishwoman knits sweaters to keep her chickens warm. Egg-layers can't acclimate to cold weather after spending their entire lives in cages, need extra insulation. U.S. chickens just move to Tampa.



### FORECASTING

 In a protest against their strict dress codes, weatherwomen all over America wear same dress, purchased from Amazon. No one knows what newsmen are protesting with their identical hairstyles.



### BEARDS

 From Brooklyn emerges Glitter Beard pirate, who leaves sparkle-flecked trail of facial hair in his wake. The sequined swashbuckler rides subway screaming at commuting hipsters, "Bluebeard was so meh!"



### CATS

 After Belgian authorities ask citizens to not tweet information about raids following Paris attacks, social media users flood #BrusselsLockdown with silly cat memes. The only thing we have to fear is Garfield.



# AIRPOC IN





**CONCERN ABOUT  
POLLUTION IS  
FINALLY PUSHING  
CHINA TO ACT  
ON CLIMATE  
CHANGE. SLOWLY**

**BY BILL POWELL**

# IN NOVEMBER 2013, CHINA'S CAPITAL CITY HOSTED WHAT THE RULING COMMUNIST PARTY HAD HOPED WOULD BE A HISTORIC MEETING.

The core purpose of the gathering? The new president, Xi Jinping, and his prime minister, Li Keqiang, were to unveil ambitious economic plans to jump-start a desperately needed new phase of development in the world's second-largest economy.

Instead, the meeting became an embarrassment. Not because of anything the leadership said or did but because of what was going on outside. For days, during and after the gathering, Beijing was enveloped by dense smog. Hundreds of thousands of citizens wore face masks when they had to go outside, many refused to go outside, and 2013 became popularly known as the year of the "airpocalypse." Even the state-owned propaganda organs had to acknowledge the truth: Pollution was "a nationwide scourge," chided the *China Daily* newspaper. "Do we still think that it has nothing to do with us, when people can hardly see each other when they are standing within five meters of one another in some eastern cities? Do we still consider environmental protection something far removed from us when we have to wear a mask so we don't develop respiratory problems?"

At a dinner with friends in Beijing during that plenum, I sat chatting with a young man known as a "princeling"—the son of a senior leader in the party. The smog was all anyone could talk about. The young man, like so many other children of the elite, had gone to school in the West and now frequently traveled to the U.S. on business. He was seething. For the world media to be focused on the filthy shroud choking China's capital, rather than what the party was doing, "was an absolute embarrassment. It has to get fixed." I asked him whether he thought the children of the leaders were communicating that



to their fathers. He gave me an "Are you kidding me?" look, which meant: You better believe they are.

Then came an interesting—and pointed—exchange. Another American at the gathering said, offhandedly, "Yeah, it really would be good if you guys could get a grip on climate change."

The young Chinese man scoffed at her. "Climate change?" he said incredulously. "No one in China gives a damn about 'climate change.' We care about having air we can breathe and water we can drink."

Starting November 30, the world's political and environmental elite have gathered in Paris, under ferocious security, for the 21st session of the United Nations Conference of the Parties, which runs until December 11. Faced with what U.S. President Barack Obama and Secretary of State John Kerry have called the greatest threat to mankind, world



**ELEPHANT IN THE ROOM:** Two-thirds of China's energy comes from coal. In November, the government confirmed it had underreported how much coal China burns by 17 percent, or 600 million tons a year.

leaders from every nation are expected to sign an agreement to reduce greenhouse gas emissions, the driver of climate change.

For years, China has been the world's leading emitter of greenhouse gases and thus, in the eyes of some in the environmental community, public enemy No. 1. China chafes at the criticism and will sign whatever document emerges. But don't be fooled. Amid the outward signs of cooperation between developed and developing nations on climate change, China remains, at best, wary—and in the minds of many officials at home, deeply resentful—of the pressure the West has brought on Beijing to rein in CO<sub>2</sub> emissions.

#### **'ENVIRONMENTAL IMPERIALISM'**

COAL IS THE dirtiest of fuels, and China's "airpocalypse" is intimately linked to its huge and politically powerful industry. China's extraordinary economic rise over the past 40 years has relied on cheap and plentiful energy. Coal makes up 66 percent of overall energy use in China today. Its massive manufacturing sector relies largely on coal-fired power plants. In fact, the government's statistical bureau confirmed in early November that it had underreported just how much coal China burns—by 17 percent. That's 600 million tons of coal a year, or 70 percent of the United States's total annual coal use. Last year, under Xi—who has promised China will begin to reduce its overall CO<sub>2</sub> emissions by "around 2030"—the government approved plans to build 155 coal-fired power plants by 2020. That's just shy of three approvals per week last year.

In the United States, Obama is waging what his

**"NO ONE IN CHINA GIVES A DAMN ABOUT 'CLIMATE CHANGE.' WE CARE ABOUT HAVING AIR WE CAN BREATHE AND WATER WE CAN DRINK."**

critics call "a war on coal." He views climate change as one of his "legacy" issues, and his Environmental Protection Agency, under the guise of its Clean Power Plan, effectively refuses to sign off on new coal-fired electricity generation (something 24 states have filed suit against). China—along with several of its neighbors in Southeast Asia—believes the United States has tried to extend that war beyond its borders. Beijing, diplomats say, thinks the U.S. has put pressure on the World Bank and the Asia Development Bank to withhold financing from coal-fired power plant projects.

Some in Beijing suspect this was also partly behind Washington's reluctance to back China's drive to launch its so-called Asian Infrastructure Investment Bank (AIIB). "We believe all the talk about lending standards and best practices and all of that—which the U.S. used to hold back its support—was only part of the story. You were concerned we'd finance coal-fired power, and we will," says a member of a Chinese think tank who often advises Beijing's powerful National Development and Reform Commission (NDRC). The Obama administration denies that fear of coal project financing has anything to do with its tepid support for the AIIB.

As the Paris conference drew nearer, the U.S.

publicly heaped praise on China for the targets it has set to reduce CO<sub>2</sub> emissions—reducing their growth and then moving to outright cuts around 2030. “This is the political breakthrough we’ve been waiting for,” cheered Timothy Wirth, a former U.S. undersecretary of state for global affairs and now vice chairman of the United Nations Foundation, when Xi first made his promise to Obama to limit emissions. In private, there is far more skepticism—and for good reason. In truth, the commitment Beijing made was far less dramatic than it seemed. The peak date for emissions was in line with forecasts already made by several state-backed think tanks: The China Academy of Social Sciences said in a 2014 study that slowing rates of urbanization would likely mean industrial CO<sub>2</sub> emissions would peak around 2025 to 2030 and start to fall by 2040.

Furthermore, China has made it clear that it won’t be legally bound by whatever comes out of the Paris summit. “The time line China has committed to is not a binding target,” says Li Junfeng, an influential Chinese climate policy adviser linked to the NDRC. In mid-November, Kerry confirmed that the so-called COP21 agreement in Paris will not be a treaty and thus not legally binding on the signatories.

There are several reasons for that. For years now, ever since the West—the United States in particular—began to obsess about “climate change,”

## “THE TIME LINE CHINA HAS COMMITTED TO IS NOT A BINDING TARGET.”

suspicions were rampant in China. At a climate conference I attended nearly a decade ago, one Chinese delegate took to the floor to rant about “outside forces” trying to keep China down by changing the global energy rules overnight: “You got to build your economies on cheap energy—coal and oil—but now that we’re growing fast, you’re not supposed to use coal and oil anymore.” This, he said, was “ladder-up economics.” Just as China began to rapidly climb up the ladder, economically speaking, the West was trying to yank it up.

Despite increasing evidence that climate change is wreaking havoc globally, not much has changed. Gal Luft, co-director of the Institute for the Analysis of Global Security, a Washington-based think tank focused on energy security, spends about half his time in China. He says the phrase often heard behind closed doors in Beijing nowadays is “environmental imperialism”—a desire for the West to impose its environmental and energy use standards on the developing world.



In this line of thinking, China gets little or no international credit for the strides it has made in reducing what could easily have been a far larger carbon footprint. Its massive buildup of hydroelectric power—there are 47,000 hydro-dams in China—as well as its aggressive nuclear power program (29 new plants are under construction or have been approved—units that will more than double Beijing’s nuclear capacity by 2020) together reduce more than 10 times the emissions that the CAFE standards in the U.S. and Europe combined cut. (CAFE, or Corporate Average Fuel Economy, refers to fuel-efficiency standards for automobiles.)

“I don’t think the rest of the world understands how aggressive China has already been in diversifying its [fuel mix],” says Luft, “or how much worse the situation would be had they not.”

### **CHINA’S ENERGY WAR**

**LAST YEAR**, the Pew Research Center surveyed public opinion to gauge what issues were most pressing to the Chinese people. First was corruption. Second was pollution. Climate change? It didn’t make the list.



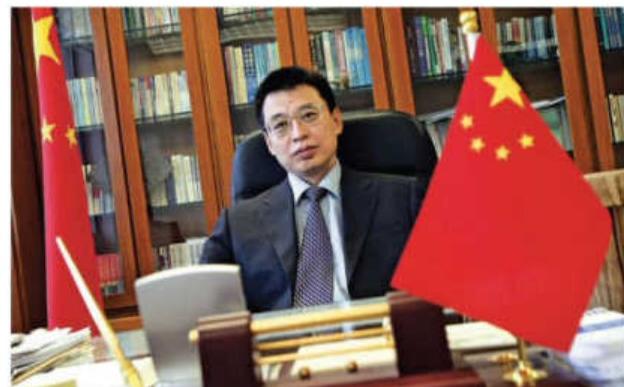
**FIGHTING BACK:** The Xiaolangdi dam, above, is one of China's 47,000 hydro-dams. Renowned pollution fighter Pan Yue, right, was recently promoted at the environmental protection ministry.

Xi has launched an aggressive and unprecedented campaign against corrupt officials, even going after some who were formerly considered untouchable. Most notably, former head of internal security and Politburo member Zhou Yongkang was arrested last year and hasn't been heard from since.

Some believe the anti-corruption campaign is also targeted at powerful vested interests in China that stand in the way of changes Xi wants: economic reform, enhanced energy efficiency, a healthier environment and, yes, reduced carbon emissions. Among the targets in this corruption purge have been energy industry heads who have most resolutely resisted reforms that could lead to greater efficiency and, ultimately, less pollution in China. While Zhou's last job was security czar, most Chinese citizens know that he grew up in the oil industry, where he had (and still has) a vast patronage network. His arrest "sent a pretty clear signal that it couldn't be business as usual in the oil sector anymore," notes Damien Ma, a fellow at the Paulson Institute, a think

tank started by former U.S. Treasury Secretary Hank Paulson that is dedicated to working with China on climate and other environmental issues.

The number of cars on China's streets is surging: Twenty million new ones were sold last year. That growth has made transportation the country's second-largest contributor to both air pollution and CO<sub>2</sub> emissions. For years now, China's envi-



ronmental protection agency has been insisting on improvements to the fuel quality standards at the nation's largest refining companies—China National Petroleum Corp. (CNPC) and Sinopec. The ministry tried to bring pressure, and laws were passed by the National People's Congress, which generally does little more than rubber-stamp the Communist Party's policies. The two state-owned oil giants—CNPC alone employs 1½ million people—simply refused.

After "airpocalypse," the central government could not let that kind of intransigence stand. It finally insisted the refiners comply, and, for good measure, Keqiang recently gave renowned pollution fighter Pan Yue a senior position in the environmental protection ministry.

Pan earned a reputation as an effective fighter within that ministry. In 2005, he halted 30 large infrastructure projects run by state-owned enterprises and in the process made himself a lot of enemies. In 2008, he resigned. He is now head of assessments at the ministry, with a broad mandate that, if he is backed up by those at the top, gives him significant authority to again crack down on polluters.

Pan has also used his anti-corruption campaign to shake up the coal industry. In Shanxi province, the heart of China's coal country, more than a dozen officials have been charged in anti-corruption probes, and rumors are rampant that there are more to come. To understand how significant that was in China, consider this: The first family of the power generation sector in China is hugely influential. The governor of the Shanxi province is Li Xiaopeng, former CEO of one of the country's largest electric utilities.

Li's father is Li Peng, who was Deng Xiaoping's premier and the hard-liner who infamously advocated most vociferously for the crackdown in Tiananmen Square in 1989. Until now, few had had the stomach to take on China's coal lobby, because few wanted to mess with the Li clan.

Xi's attack on coal interests has sent a sharp signal that change needs to come to a hugely corrupt and environmentally damaging industry. Environmental activists in China have been heartened. But it's important to remember that the Chinese government's goals do not jibe completely with the anti-coal desires of the climate change movement.

According to industry sources, consultants and representatives of nongovernmental organizations (NGO), Beijing seeks to make the coal-fired power plant industry more efficient—and in the process,

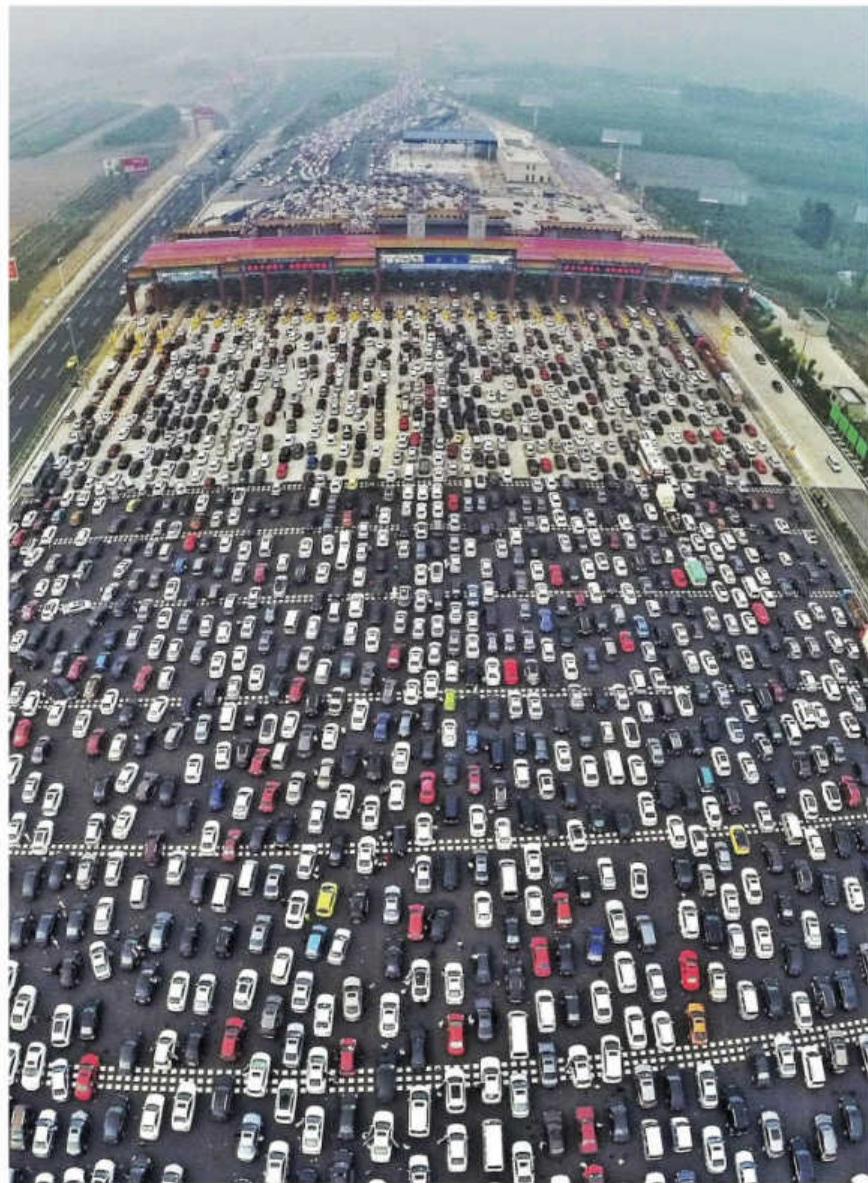
## LAST YEAR, CHINA APPROVED PLANS TO BUILD 155 NEW COAL-FIRED POWER PLANTS BY 2020.

cleaner. And it is succeeding. The 155 plants approved in 2014 will generate significantly more power per unit of coal used than plants built 20 years ago, and they are far less polluting. And last year, China "pre-washed" more than twice as much coal as it did the previous year before burning it, a key step in reducing particulate emissions. But the power plants still emit significant amounts of CO<sub>2</sub>. Thus, as Luft says, "coal is still the elephant in the room, and you're not going to wean China off of it as fast as a lot of people would like. That's simply a fact."

### CHANGE YOU CAN BELIEVE IN...EVENTUALLY

**FOSSIL FUEL USE** is not the only area in which change is not coming as quickly as many in the West would like. For over a decade now, environmentalists have waxed rhapsodic about how, because of its population size, China would be able to scale any number of new, environmentally critical technologies—from renewable energy like wind and solar to millions and millions of electric cars. To date, renewable energy plus nuclear (including hydro) accounts for just 10 percent of China's overall electricity generation. By 2020, it plans to raise that to 15 percent. And of the new cars sold last year in traffic-clogged China, less than 1 percent were electric.

The problem: Renewable energy and electric cars need a new electricity grid, a so-called smart grid



**+ SMOG ALERT:** Holiday traffic returning to Beijing in October, above. At right, performance artist Kong Ning wears a wedding dress decorated with 999 face masks, in a protest over air pollution in 2014.

that can store energy when it's not needed and have it ready when it is. China's grid, for the most part, is 20 years old. It's reliable and brings electricity to the entire country (unlike, for example, India, the second most populous nation in the world, where 400 million go without electricity). But it is a dumb grid, and it will take a long time to change that. China, most analysts believe, will get there. But it is likely to take two decades or more. "People still need to be patient, and understand where we are in our development cycle," says the academic consultant to the NDRC.

After a decade and a half of investment-led growth, which fouled the air and the water, that development cycle is now changing. The economy is slowing and will not go back to the 10-percent-a-year days. Consumption is now starting to supplant



investment as the engine of growth, which will benefit the environment. And the waning investment boom leaves in its wake a much more energy-efficient industrial base.

Consider Dongfeng Motor Corp., a legendary state-owned auto company. In 2002, I visited one of its first factories, outside of Wuhan in central China. The plant had been built way up in the mountains during the Mao Zedong era. It was a location rooted in security, not commerce. (“Dig deep and love the motherland” was a slogan of the time.) The factory belched out smoke, and there was no industrial robot to be seen—only thousands of workers toiling on an assembly line that looked like Detroit circa 1950. Today, the old plant is long gone; in its place is a modern facility that employs 5,000 fewer workers but churns out twice as many cars a year as it used to. And, the company says, it consumes much less energy doing so.

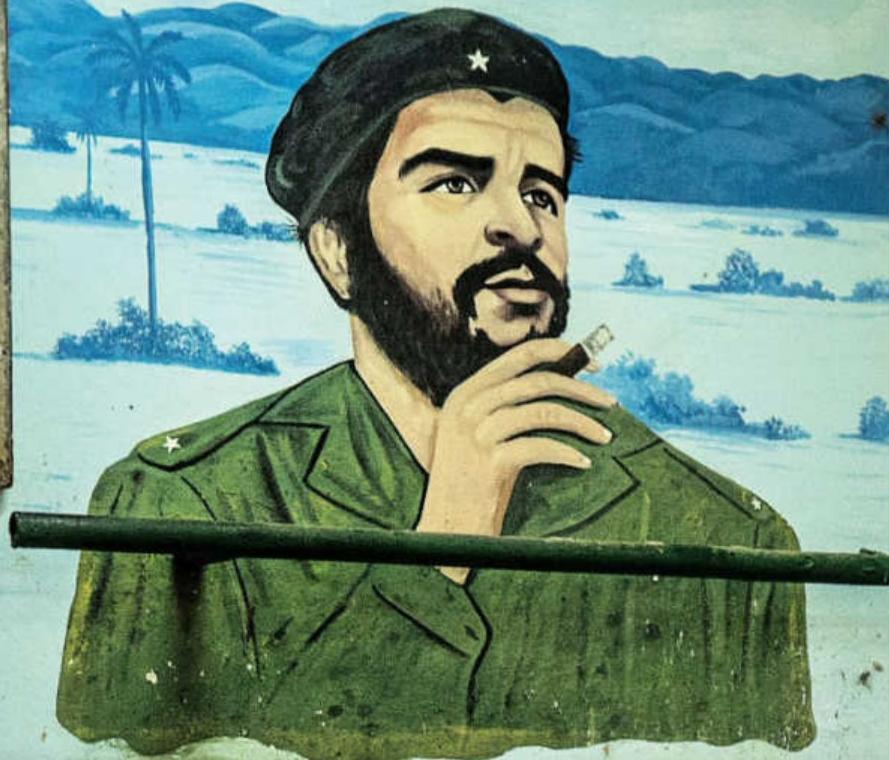
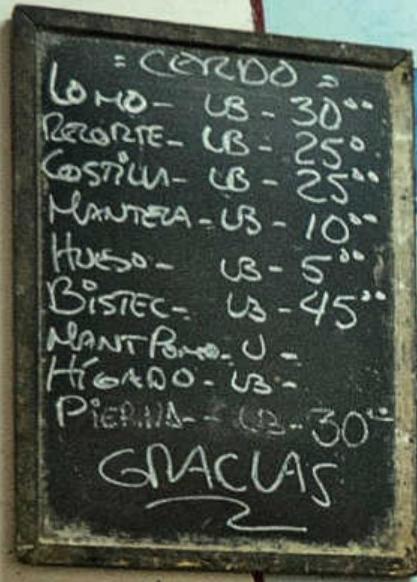
There is still powerful resistance to economic and environmental change. What was true in Pittsburgh, Germany’s Ruhr Valley or the environmental catastrophe that was the Soviet Union is now true throughout China: Powerful economic interests dig in their heels. At a recent daylong seminar on energy policy and the environment, the NDRC—the

key economic-planning agency in China—outlined priorities for creating a more efficient, cleaner and more sustainable energy sector. It laid out goals for boosting natural gas use instead of coal in electric power plants, for example, and explained its ideas for moving China more rapidly to a smart grid.

NGO representatives had been invited to the meeting, as were many constituents whose industries would be affected by such reforms. When the floor was open for responses, an executive from State Grid Corporation of China, the organization that oversees all of China’s electric utilities, methodically picked apart the NDRC presentation. This isn’t possible, at least not now, he said of one proposal. This can’t happen either. The smart grid will take a lot of time and is very expensive. And so on.

“It was,” says an NGO rep who was present, “amazing—and discouraging.” Here was one of the country’s most powerful vested interests in effect saying, “Slow down here, folks. We’re not with the program.”

As the world toasts with champagne glasses raised in Paris, celebrating progress in the climate wars, remember that scene. In the nation that emits the most greenhouse gases in the world—and confronts more dire environmental problems than anyone else—nothing is going to come easily. ■



T-13



# WHEN THE COWS COME HOME

FROM TOOTHPASTE TO TOILET  
PAPER, SHORTAGES ARE COMMON IN **CUBA**.  
BUT AS THE COUNTRY WARMS TO  
CAPITALISM—AND THE U.S.—THAT MAY  
CHANGE. A PRIME EXAMPLE: **BEEF**

BY TAYLOR WOFFORD  
WITH HANNAH BERKELEY  
COHEN IN HAVANA

**CHE BURGERS:**  
Beef is a rare com-  
modity in Cuba,  
even at this butch-  
ershop in Havana's  
thrrumming Maod  
Catedral Market.



## EVERY TIME GATOR EJACULATED, DAN MARVEL GROSSED 10 GRAND.

At the time of his death last year, the bull was a ton and a half of genetic perfection—or as close to it as has ever been recorded for his breed (Red Brangus, a dewlapless, humpbacked strain, three-eighths Brahman, five-eighths Angus and usually russet in hue, hence the name). And he was prolific: Marvel, his owner, says with pride that Gator once produced more than 400 “straws”—a half-cubic-centimeter swizzle stick of bull semen being the standard measure—from a single ejaculation.

Gator’s semen was white gold because, drop for drop, the seed of a prize-winning bull is worth more than gasoline, penicillin and human blood combined. It’s not the most valuable liquid in existence (that distinction goes to scorpion venom, which has medicinal properties), but it’s close.

Five years ago, Marvel received an intriguing phone call from John Parke Wright, a wealthy investor from Naples, Florida. Wright knew someone who wanted to create a beef cattle herd, and his client needed a hefty amount of Gator’s semen: thousands of straws. The deal would earn Marvel and his wife, Sandra, \$50,000, a huge haul for them. The only catch: They had to make it happen in one of the least business-friendly places on earth: the communist island of Cuba.

Six months after that chat, the Marvels were in Havana. They met Wright at a nondescript office building in Miramar, the city’s diplomatic quarter, which serves as the headquarters of the National Enterprise for the Protection of Flora and Fauna, the Cuban equivalent of the Environmental Protection Agency. A receptionist led them to a small conference room with a dark wood table and chairs, the walls lined with portraits of the Castros and other Cuban leaders. As they sipped espresso and bottled water, an elderly Cuban official walked into the room and greeted them. He kissed both of Sandra’s cheeks—the Latin kind of kiss, as she describes it. His name was Guillermo García Frías, a *comandante* in the Cuban army who fought alongside the Castros during the revolution, a former vice president and current head of the environmental agency.

García, who reportedly saved Fidel Castro’s life during the revolution, is Cuba’s canniest cattleman, Wright says. He had a new ranch called El Macho, he told the Marvels, and he wanted to turn it into the first large-scale, high-quality beef production operation on the island in more than five decades. He had the land: 150,000 acres in Camagüey. What he didn’t have: cows or capital.

There are two ways to increase the size of a herd. Go the natural route (put bulls and heifers together and wait), which can take years, or import a

large number of heifers (20,000 would suffice, Wright ventures) and artificially inseminate them—but that method can take a lot of cash. “We’re talking about a serious investment,” he says.

Still, García chose the latter option. A couple of weeks after meeting with the comandante, the Marvels received in the mail a check for about \$50,000. What García got in exchange was more than just spunk; it could be the seeds of a capitalist revolution.

### ¿DÓNDE ESTÁ LA CARNE?

IN CUBA, shortages—from toothpaste to toilet paper—are a fact of life. Food is no exception. Beef, once a staple of



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**SEED MONEY:** This new herd at el Macho Ranch is the product of bull semen imported from the U.S.

the Cuban diet, can be next to impossible to find on the island. Sometimes, it will disappear from markets without warning for months, says Alexis Naranjo, whose restaurant, Los Naranjos, recently debuted in Havana's tony Vedado neighborhood. "I can't sell it," he says, because "there isn't any place to buy it." When you can find it, it's exorbitantly expensive, which means tourists are among the few people in Cuba who consume it.

Like most restaurant owners here, Naranjo sometimes turns to the thriving black market to meet his needs. But he won't buy beef there. "If you get meat and the police find out, they will close the restaurant," he says. It's not that the government is concerned about the health ramifications of eating black market beef, which is mostly pilfered from state-run butcher shops. It's because beef is so scarce, the government controls who gets *carne* and who doesn't. To protect its monopoly, the state even passed legislation making slaughtering cattle without explicit government permission a crime carrying a sentence of up to five years in prison—even if you own the cow.

The shortage is worse outside the major cities. And the contrast between meat served at Havana's privately owned restaurants and what rural Cubans eat is "shocking," says Parr Rosson, head of the Department of Agricultural

## SPURT FOR SPURT, THE SEED OF A PRIZE-WINNING BULL IS WORTH MORE THAN GASOLINE, PENICILLIN AND HUMAN BLOOD COMBINED.



Economics at Texas A&M University and an expert on U.S.-Cuba trade. "There are cuts of chicken you can't identify," he says. "I don't know what they are."

Cubans would like less mystery in their meat, but change happens slowly on the island. *Un poco, un poco*, "a little, a little," as people here like to say. But it's happening, especially with respect to the United States: In April 2009, U.S. President Barack Obama took the tentative first steps to ease the tension between the two countries. The administration lifted restrictions barring Cuban-Americans from traveling to the island and uncapped the amount of money they could send to relatives back home. Havana later implemented reforms designed to encourage small pockets of capitalism. In 2010, the government began allowing more Cubans to work for themselves and to hire others. Since then, the number of small-business owners and entrepreneurs has more than tripled, according to one recent paper.

Now, six years after Obama's first announcement—the Cuban government's arrest and imprisonment of the American aid worker (and alleged spy) Alan Gross in 2009 slowed things down—the relationship between the two Cold War adversaries is finally starting to thaw. Most Cubans welcome this development, but few want things to go back to how they were before the revolution, when Cuba was a de facto colony of Washington and Havana was



a decadent playground for wealthy gringos.

Doing business with Americans presents Cuba with not only an opportunity but also a threat. To improve the lives of their people, Cuban officials are dabbling with capitalism across the economy, including the beef industry. In need of everything from new tractors to plow their fields to wind turbines to upgrade the island's turn-of-the-century electrical grid, they have begun to bargain with businessmen such as Wright and Marvel. But they're afraid of giving away too much in the process—especially to their neighbors up north. So as Cuba transforms and opens to free enterprise, the Communist Party is proceeding cautiously, trying to make sure noth-

**CALLING A FOWL:**  
Food shortages have forced Cubans to get creative, which may mean eating chicken that should probably come with air-quotes.

ing endangers its monopoly on power. As Fidel Castro explained in a 1966 speech, "Revolutions are not undertaken to leave things as they were."

## CUBANS ATE DOMESTIC CATS, AND PEACOCKS AND BUFFALO MYSTERIOUSLY VANISHED FROM THE ZOO.

### SOVIET SUGAR HIGH

CUBA HASN'T always been a nation with empty shelves, and its beef shortage is a relatively recent phenomenon. In 1958, one year before Castro ousted the U.S.-backed dictator Fulgencio Batista, there was nearly one cow for each of the island's approximately 6.5 million inhabitants. More than 50 years later, there are almost twice as many

# "THERE ARE CUTS OF CHICKEN YOU CAN'T IDENTIFY. I DON'T KNOW WHAT THEY ARE."

Cubans, but the country's herds are 30 percent smaller than they were in 1958, according to Carmelo Mesa-Lago, a Cuban-born economist at the University of Pittsburgh.

Most Cubans point to the embargo to explain the state of the beef industry, and many economists agree that it's at least partly responsible. But some analysts say Cuba's socialist system deserves a big part of the blame for the country's economic misery. "You've got a central planner sitting in a high-rise Ministry of Agriculture building in Havana, trying to tell growers in the eastern provinces what to do with their pastures," says William Messina, an agricultural economist at the University of Florida's Food and Resource Economics Department. "What the hell does a person in Havana know? Maybe it's been a rainy summer. Maybe there's been a drought.... Pretty poor decisions get made."

At the root of all Cuba's food woes is its greatest resource: sugar. The island had been almost entirely dependent on the crop since it was introduced hundreds of years ago, allegedly by Christopher Columbus. As Castro put it in a 1959 televised address, "One of our greatest causes of economic dependence on the United States is sugar, and it is imperative that we diversify our production and our markets." Following the revolution, the Castro government announced plans to do just that, but two years later, Havana changed its tack; the Soviet Union offered to pay above-market prices for Cuban sugar in exchange for access to the island. Despite its earlier ideas about diversification, the Castro government again poured most of the nation's resources into sugar. By the 1980s, Cuba was the world's third-largest sugar producer, behind Brazil and India.

Then, in 1991, the Soviet Union collapsed and took Cuba's economy with it. By that time, Cuba's agricultural sector was heavily mechanized, and Moscow was the source of most of what was needed to sustain the industry—from fertilizers to new tractors. Lacking the infrastructure to grow much beyond sugar and unable to command the inflated prices it had enjoyed for 30 years, Cuba had no way to feed itself. This era of Cuban history—euphemistically called the Special Period—saw the average Cuban shed about 12 pounds, according to a 2013 paper published in the *British Medical Journal*. Cubans ate domestic cats, and peacocks and buffalo mysteriously vanished from the Havana zoo, according to *The Economist*.

With some of the best farmland and pastures in the Western Hemisphere, Cubans don't need to eat pets. "Cuba should increase its beef production, without any question," says Pedro Sanchez, the Cuban-born director of the Agriculture and Food Security Center at Columbia University. In four to five years, Cuba could be importing 40 percent of its food, instead of 80 percent. "We have to make a proper plan, but all the elements are there," he adds.

One of those elements arrived by private plane in Havana last year. Inside, supercooled with liquid nitrogen, was a gallon of Gator's goo.

## CAN YOU MAKE A BUCK IN CUBA?

EARLIER THIS YEAR, Wright invited me to El Macho to witness what's become of Gator's seed. To reach the ranch, his chartered Chinese minibus

passes through the Sierra del Chorillo nature preserve, one of 48 protected areas managed by García's agency. The preserve is 10,000 acres of pristine wilderness where unshod ponies caper beneath a canopy of piñon pines and fossilized tree stumps jut from the earth.

As Wright steps off the minibus, he introduces me to Barbaro Casa López, the ranch's foreman, an intense-looking man with a blue-black mustache and straw cowboy hat. Casa López is already putting Gator's semen to use, he says, and offers to show us. He leads Wright and me down a muddy lane between rows of enormous, empty pens. In one, about 20 bulls are corralled. These are Gator's offspring, Barbaro tells me. Wright claims they're the first cross between an American bull and Cuban heifers in more than 50 years. They're a year old and fattening up nicely, gaining nearly 2 pounds per day, Barbaro says. They'll keep gaining until they weigh about 1,400 pounds. Then they'll be sent to slaughter.

El Macho turns a small profit, but its earnings are limited because it can sell only to the state, and the state, not the market, dictates prices. In June, Barbaro says, the government increased the price for steers to 2,000 Cuban pesos a head—roughly \$80. The result is that cowboys and ranch owners both earn less than bartenders and taxi drivers in Havana.

The only way to make real money in the cattle business in Cuba is to scale the operation massively. And the only way to do that quickly is with foreign direct investment. That's why Wright is helping García find partners and investors stateside. "It's very simple," he says. García can offer American investors a stake in El Macho—"say \$200 million for 50 percent." That \$200 million will be used to increase the breeding stock and ramp up production of meat.

But many Americans are wary of investing in Cuba because the state almost always insists on having a majority stake in partnerships with foreign companies. And the island doesn't have a sterling reputation in the minds of investors—expropriating billions in assets from U.S. corporations doesn't scream "open for business." Wright insists American companies shouldn't be afraid. It's a myth that you can't

make a buck in Cuba, he says, and he intends to prove it with El Macho. If Americans discover a business-friendly climate here, Wright believes Congress will be inclined to lift the embargo. "We're going to use these cows to break the blockade," he crows.

"Si," Barbaro says. "It all depends on the blockade."

It's not so simple. As part of the thaw, Washington is rolling out incremental reforms, like allowing ferry service to Havana and lifting export restrictions on telecommunications equipment. But Cubans have been hesitant to embrace American investment. "We haven't gotten Cuba to green-light a single deal," says James Williams, president of the lobbying group Engage Cuba. "Part of it is they're just overwhelmed. People from all over the world are coming here like they've never come before."

There are other hurdles too. For the Cubans, the end of the embargo is the next step in the negotiations. But the U.S. sees the end of the embargo as the last step, a reward for progress on human rights, property claims and law enforcement, among other things. "We think Congress would look very favorably on those [changes]," says a State Department official with knowledge of the negotiations, who spoke on the condition of anonymity because the talks are sensitive. "Support would be more attainable if they could make progress."

Maybe, but Congress seems reluctant to let Americans deal directly with the Cuban government, preferring to encourage investment in small businesses. Of course, in Cuba the difference between privately owned and government-owned is rarely clear-cut, says Paul Johnson, co-chair of the U.S. Agriculture Coalition for Cuba. "I don't know if you'll ever be able to draw a distinction," he says. "It's a one-party system, and the government has a lot of control in business decisions." Johnson says U.S. investors should flock to Cuba, even if it means getting into business with the Communist Party, because that's the way Cubans want it. "We need to respect their sovereignty," he says. "It's in the U.S.'s best interests in the long run. Otherwise, you're just laying the seeds of future revolution."

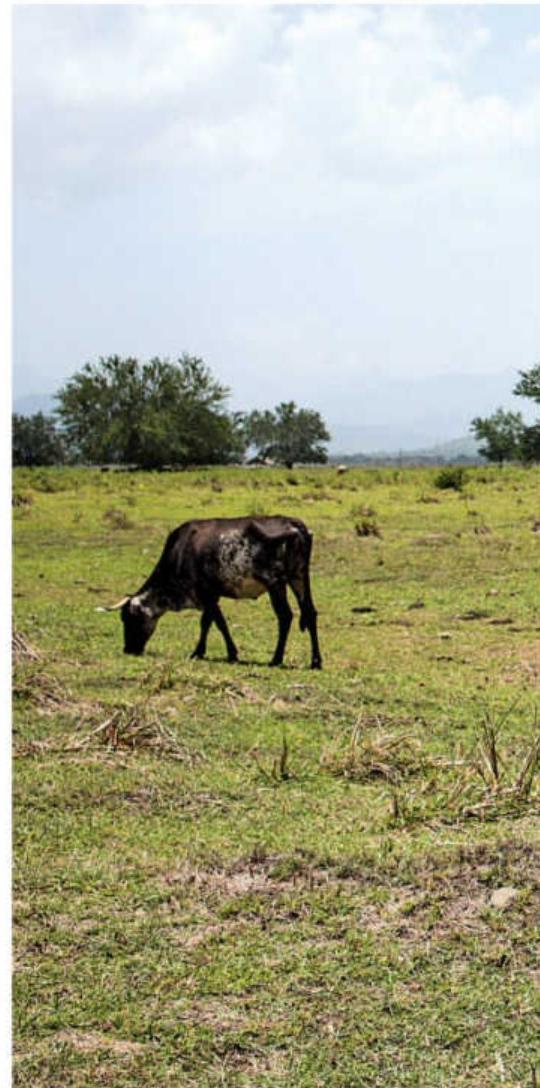
Williams agrees. Most Americans, he says, don't know how to do business in Cuba. The Cubans "have a process," he says, "and companies have been ignorant or naive of that process."

John Parke Wright is not most Americans. He has been doing business in Cuba since the mid-2000s, shipping beef and dairy cattle from Texas, Florida and elsewhere (the embargo on agricultural commodities to Cuba was lifted in 2000). Until Washington and Havana hammer out their differences, Wright is comfortable conducting his business the Cuban way. And for Wright, beef is more than just business. Beef is personal.

### **YANKEES, WORMS AND TRASH**

"THIS WAS my family's land," Wright says, stepping off his minibus and waving his hand at 15,000 acres of Cuban wilderness. He plucks a Romeo y Julieta cigar from the breast pocket of his guayabera, lights it and inhales the smoke. Wright always wears a guayabera when he's in Cuba, but there's no mistaking him for a local. His 10-gallon Stetson, navy Brooks Brothers blazer and ruddy complexion give him away. Americans are a rare sight in Havana, and they are virtually unknown on this stretch of rural highway in the foothills of the Sierra Maestra, some 450 miles southeast of the capital. Except for Wright, who for the past 17 years has been a frequent and quizzical sight here.

Through his mother, Wright is a member of the Lykes clan, the 12th-largest landowner in the U.S., according to The Land Report. With a net worth of \$1.2 billion, the Lykes are the 193rd wealthiest family in the country, according to *Forbes*. Before the Cuban revolution, his family owned two cattle ranches in Cuba, plus various properties in Havana, including the



+

**COW TOWN:** Before the revolution, the Lykes ranch was bigger than Manhattan.

city's largest meat-packing plant. Like many Americans who lost wealth during the revolution—or, as many Cubans see it, whose property was returned to its rightful owners—Wright thought his family's riches were gone. Then, in the late 1990s, he says, he met a diplomat named Carlos Lechuga, who was Havana's ambassador to the United Nations during the Cuban missile crisis. "Señor Lechuga suggested I show more interest in my mother's land," Wright says. Before long, Lechuga introduced him to Ramón, Castro's older brother. The two became "dear friends" and traveled the country together, Wright says. After Ramón became too old to leave Havana, his son, Ángel, took his place on Wright's rural sojourns.



**"IF THEY THINK THEY CAN STOP ME FROM LIVING ON LAND THAT BELONGS TO ME, AND THEY WANT TO THROW ME IN JAIL, LET THEM TRY."**

A few miles down the road, a sun-tanned farmer in yellow sweats pulls aside a razor-wire fence to let us inside. Wright leads me down the dirt road to the interior of the ranch, seemingly impervious to the heat, the mud sticking to his shoes or the fat sow that waddles away resentfully at his approach. Soon we arrive at the old ranch house. There are holes in the roof. Inside, the floor is a jumble of broken cobblestones. Shadowed hollows suggest where doors and windows used to hang.

In the 1950s, La Candelaria, which is slightly larger than Manhattan, was one of Cuba's best ranches, Wright says. It employed a dozen or so cowboys who tended 7,500 head of cattle, according to an article from *Fortune* in 1954.

Today, its only permanent tenants are a timorous herdsman and a few dozen rangy crossbreeds. "For 10 years, I've been asking the Castros about why these ranches that were so well-run up to 1959 are idle today," Wright says. "The answer's been, 'It's the blockade. The embargo.' That's a good excuse, but it doesn't cut it."

Wright wants to come back, to restore La Candelaria. But the Cubans have so far responded tepidly to his requests. While they may

On the afternoon that I join Wright on his trip to the countryside, Ángel comes too. A portly, amiable man in his mid-50s, Angel has short, gray hair and coke-bottle glasses. Unlike his father and his uncles Fidel and Raúl, he's clean-shaven. As Wright and I survey the land, Ángel takes a *siesta* in the back of the bus.

Outside, butterflies bob in the tall, sun-blushed grass. The flatbed trucks and horse carts that pass for buses and taxis in this part of the country intermittently trundle back and forth from nearby towns. Wild turkeys loiter near a dusty dirt track leading to La Candelaria, one of the two cattle ranches that used to belong to Wright's family. Once, seven royal palms grew here, one for each of Wright's great-great-uncles, who earned the family's fortunes in Cuba. They're gone now. A tumbledown portcullis, 10 or 12 feet of orange brick, is all that remains to mark the entrance. "It's a little sad," he says with a half-smile. "I'm glad they've kept the gate, at least."



**SHORT SELLERS:** The U.S.-led embargo didn't depose Castro, but it did create many hardships for Cubans.

need people like him—people familiar with the culture who have a vested interest in seeing Cuba return to prosperity—they are also wary of returning expropriated property. To do so would set a dangerous precedent, one that might see a flood of Cuban exiles and their descendants returning to the island, demanding their land back, or, failing that, compensation for it, which the Cubans can't afford to pay. And fear of the exiles' homecoming is pervasive on the island, says Michael Kelly, a Cuba policy expert and associate dean at the Creighton University School of Law. "That's what the Castro government has been feeding them," he says. The government cannot be seen to be doing business with the exiles, a group it has spent decades denouncing as *gusanos* (worms) and *escoria* (trash).

Wright is adamant about returning to his family's former plot, even though it's illegal in the U.S. for citizens to negotiate with the Cuban government. "If Congress tries to stand in my way, I'll go around them," he growls. "If they think they can stop me from living on land that belongs to me, and they want to throw me in jail, let them try."

And while Wright stands to profit from having his family's land returned to him, he says money isn't his only—or even primary—motive for wanting to return to Cuba. His main motivation, he says, is restoring an industry that can feed the island's 11 million people. That may sound self-serving, but Wright is already rich, and if he wanted to become wealthier, there are easier ways to do so than negotiating with Communist Cuba. "It's criminal," he says. "They're using food as a weapon of mass destruction."

### A CASTLE OF CUBAN CAPITALISM

**WHETHER OR NOT** Wright succeeds, there is one place in Cuba, at least, where beef is not so rare. A morning's drive from La Candelaria is one of the best cattle ranches in the Western Hemisphere. It is called El Alcázar, which means "the castle" or "the fortress." It sits cloistered in the rising limestone foothills of the Sierra Maestra in the country's southeast. El Alcázar is one of the few cattle ranches not nationalized during the revolution. While other ranchers saw their land confiscated, María Antonia Puyol Bravo held on to hers. Wright describes her as Cuba's only card-carrying capitalist.

A diminutive 88-year-old with a crooked smile and mischievous, watchful eyes, Puyol has run the ranch for most of her life. She never married and has no children. Wright, Castro and I join her on a warm evening in June. Her white curls are cropped short and her chestnut skin is creased after years working in the sun. She wears old Nikes, pearl earrings and a wooden cross around her neck. Puyol is wealthy by Cuban standards and makes no effort to hide it. Her home, a Spanish colonial villa, is ringed with manicured gardens where a fountain of clay pots feeds a bubbling pool. Flamboyán trees form a canopy overhead. In the afternoon sunlight, their fallen leaves look like shriveled tongues of fire.

Dinner that night is plain by American standards but plentiful—platters of roasted potatoes, corn fritters, plantains, rice and beans, all grown on Puyol's land. Piles of food arrive on sterling silver trays. As we eat, the cat-

tle baroness reminisces about the revolution. In 1959, the Cuban government seized and nationalized estates larger than about 1,000 acres. El Alcázar is about 1,500 acres, yet it survived the revolution untouched.

These agrarian reforms were supposed to eliminate the sprawling plantations that enriched wealthy landowners but left their workers, mostly seasonal laborers, impoverished. The law succeeded in its goal, but it had unintended consequences. After their ranches were taken from them, Cuba's cattle kings mostly chose life in exile. Those tasked with managing the confiscated estates had neither the experience nor the skills required.

Perhaps, as Puyol suggests, the ranch survived because of her: She cites an exemption to Cuba's agrarian reform laws, which left especially productive ranches immune to expropriation, but that didn't stop cadres of government enforcers from confiscating many of them anyway. Puyol says she fought hard with the authorities to keep El Alcázar. Her close ties to the Castros probably didn't hurt either.

Puyol grew up in Birán, the Castros' hometown. With fondness, she recalls a youth spent riding horses and fishing alongside Ramón, Fidel and Raúl Castro. Even then, she remembers, they seemed preordained to rule. "Today, they run all of Cuba like they used to run Birán," she whispers with a smile. Puyol's dogs were gifts from Raúl, she says, as were her two televisions. She owns four cars, gifts from Fidel, and a signed copy of *The Strategic Counteroffensive in the Sierra Maestra to Santiago de Cuba*, one of his many books. When the revolution came, Fidel came looking for supplies, Puyol says. She provided them: gasoline, food, equipment and whatever else they wanted. Even so, not even the Puyols were left alone entirely. "Many, many ranches were ruined after the revolution," Puyol says between sips of chilled tamarind juice. Among them, an 8-million-acre estate seized from her father.

"What happened to it?" I ask.

With a knowing look, she draws her thumb across her throat. "A shoemaker," she says, "can't run a ranch." Today, it's 8 million acres of dirt.

# "IF YOU GET MEAT AND THE POLICE FIND OUT, THEY WILL CLOSE THE RESTAURANT."



## "WE'RE GOING TO USE THESE COWS TO BREAK THE BLOCKADE."

**THROWBACK:** El Alcázar is the rare ranch still functioning as it did pre-Castro.

But not El Alcázar. Her land is pristine, quite unlike any I have seen in Cuba. Her pastures are green, her cattle are healthy and well-fed, and her workers get to eat beef. Small farms and ranches similar to Puyol's have sprouted up all over the country since Raúl Castro's wave of agrarian reforms beginning in 2007. According to one recent paper by researchers at the University of Havana and the City University of New York's Lehman College, about 70 percent of the country's arable land is now in private hands. If Puyol's ranch is any indication, that's a good trend. And it's a good opportunity for American businesspeople, such as Wright, who are permitted to sell the Cubans agricultural commodities.

Before we leave, she invites us to see her land on horseback. Wright, Ángel Castro and I follow a cadre of Cuban cowboys and a herd of Puyol's mares as they bolt out of their corral and up-country. The horses wade through the Rio Contramaestre, where a pair of young women cavort in the muddy water. We follow the herd until we reach a hill the Cubans call *la vista*. Wright lights another cigar, and we watch the sunset. "Maria Antonia's ranch is the model," he says, "for the future of Cuban agriculture."

I hope he's right. It would be a shame to let Gator's seed go to waste. ■

WHO KNOWS THE OTTO MAN?



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# SIERRA LEONE

## RESILIENT STEPS TOWARDS PROSPERITY



**O**n November 7, 2015, Sierra Leone's President Ernest Bai Koroma addressed the nation to mark the end of the Ebola outbreak, following the World Health Organisation's declaration that the country was finally free of the disease. He talked about loss, about resilience, about community, and about the future. One phrase – 'a new beginning' – was repeated often in the speech, as he sought to set Sierra Leone on the road to recovery.

Occupying a territory a little larger than the Republic of Ireland on the west coast of Africa, Sierra Leone has had a turbulent history over the last half century since it gained independence from Great Britain in 1961. Democracy gave way to a series of coups in the late 1960s, leading to a period of one-party rule under President Siaka Stevens until 1991. This was followed by a decade of civil war that finally ended in 2002.

The restoration of democratic government, and the return to office of President Ahmad Tejan Kabbah in 1998, ushered in an era of political and economic stability, bolstered by demand for the country's abundant metals and minerals.

Under President Koroma, who came to office in September 2007, Sierra Leone has pushed through lauded free-market reforms and opened its economy to higher inflows of private-sector capital, achieving world-leading GDP growth before Ebola hit. According

to United Nations' figures, the nation received close to €540 million in foreign direct investment in 2013.

Home to more than six million people today, Sierra Leone has not only suffered a heavy human toll in the last 18 months – with 3,589 lives lost – but has seen its economy decimated by the epidemic, compounded by the recent crash in iron-ore prices. The World Bank expects GDP to contract by as much as 24% and the country to forego €1.85 in earnings this year, although a return to positive growth is forecast from 2016 onwards.

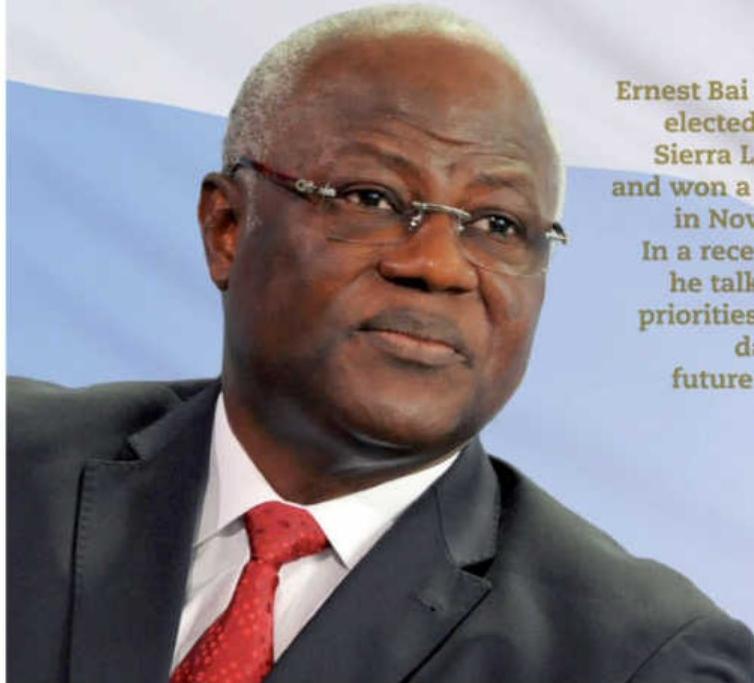
The Agenda for Prosperity, launched in July 2013, aims to serve as a blueprint for sustainable development and put the country on track to achieve middle-income status by 2035. The global community is lending its support. At the UN International Ebola Recovery Conference in New York this July, over €4.5 billion were pledged to support Sierra Leone, and its neighbours Guinea and Liberia, in the next two years.

While the fight against Ebola has been won, Sierra Leone still faces serious challenges to get back to normal: 'We are entering another difficult phase: that of recovery,' President Koroma admits. 'The battle is over, but we have to win the war by building greater resilience, ensuring recovery, and putting the country, once again, on the path of growth and development.'

Q&amp;A

# Dr Ernest Bai Koroma

## *President of Sierra Leone*



**Ernest Bai Koroma was elected President of Sierra Leone in 2007 and won a second term in November 2012. In a recent interview, he talked about his priorities, progress to date, plans for future growth, and perceptions.**

**Q:** This July, you presented the national Post-Ebola recovery plan that focuses on four sectors: healthcare, education, social protection, and the economy. What plans do you have for each of these?

**A:** We have started implementing the programme, prioritising the areas that were hardest hit. We are ensuring that hospitals and primary care facilities are safe and that children and mothers receive free essential healthcare. TB, HIV, and malaria patients are returning to long-term treatment. Ebola survivors receive free care and support. We are ensuring kids go back to school in a safe, active learning environment. We are providing infection prevention and control monitoring, waiving fees, and [offering] school meals. In social protection, we are

## SIERRA LEONE IS RIPE FOR RECOVERY AND GROWTH

*Optimistic, energetic, and focused on what the future may bring, this West African pioneer is planning to harness its natural and human resources to ensure lasting prosperity*

**S**ierra Leone faces a number of challenges on its journey toward realising its development goals, not least of which is changing the world's perception about what it has to offer. After months during which most of the stories coming out of the country started with a five-letter word, the government is keen to change the narrative and concentrate on the good news about this pioneering and peaceful West African nation.

In his introduction to 'Sierra Leone: An Investor's Guide', President Koroma highlighted just a few of the firsts that Sierra Leone has notched up over the course of its history. The first newspaper in West Africa, the Sierra Leone Gazette, was published here in 1801; the first radio service in the region began broadcasting in 1934; and the oldest public university, Fourah Bay College, in sub-Saharan Africa was founded in Freetown in 1827.

The capital was originally settled by former slaves, initially from England followed by others from the United States, who founded Freetown in 1792, laying the foundations for today's young and fast-growing society.

In addition to its natural resource riches, it is, perhaps, its people that remain Sierra Leone's greatest wealth.

Today, the country is home to 16 ethnic groups who speak more than 20 languages, in addition to English and Krio, the local version of English-based creole, but is free from inter-

**"What has been remarkable [about Sierra Leone] is the resilience and the ability to come back,"**

**U.S. Ambassador John Hoover**

delivering €37 million in income support to 150,000 households and increasing anti-poverty initiatives. At the same time, we are building capacity to provide long-term welfare support. To boost the private sector, we are providing farmers with seeds, increasing access to finance, and catalysing infrastructure investments.

**Q: How much progress has the country made since 2007?**

A: Revenue collection increased from 8.9% of GDP to more than 14% before the Ebola outbreak. Expenditure increased from €53 million in 2008 to €112 million in 2013. The economy followed a strong growth path, accelerating from double-digit growth of 15.2% in 2012 to 20% in 2013, and was projected to grow by 11.3% in 2014. Exports were expected to increase substantially in 2014. With strong supervision by the Bank of Sierra Leone, the banking sector remained safe, sound, and stable.

**Q: What steps has your government taken to incentivise investment?**

A: The private sector remains the most viable engine of economic growth. We

have continued to reform [and] removed many of the barriers to register and run a business. The creation of a 'one-stop shop' at the Registrar General's office means you can register a company within 48 hours. Our anti-graft measures are also becoming more robust. Our 'Doing Business' ranking continues to improve. The National Revenue Authority, together with the Ministry of Finance, has developed a Finance Bill and a Revenue Administration Bill for 2015 with the aim of improving efficiency, simplicity, consistency, and transparency of the tax system.

**Q: What challenges does Sierra Leone face in changing perceptions?**

A: I think the major challenges are misinformation and the fear factor. The good news is that we have defeated the virus and have learned to deal with it in case of re-emergence. My message to the international business community is that Sierra Leone is safe, the regulatory and legal framework and other reforms have ensured continuous improvements. Our goal is to become a middle-income country by 2035 and we would welcome partners that share in that vision.



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ethnic strife. Sierra Leone is also an example to be emulated for its religious freedom and tolerance. An estimated 70% of its citizens are Muslim, around 30% Christian, and a small percentage hold traditional beliefs.

"What has been remarkable [about Sierra Leone] is the resilience and the ability to come back," believes U.S. Ambassador John Hoover, who had served elsewhere in Africa before taking up the post in August 2013. "There is a very strong spirit of optimism, a desire to move forward and make things better. There is a lot of energy here and that's where opportunities are."

## Facts

**7 Nov 2015**

The World Health Organization declared Sierra Leone Ebola-free

# AGENDA FOR PROSPERITY

*Five-year plan seeks to transform almost every aspect of the nation*



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Upon taking office in 2007, the government introduced its first plan for Sierra Leone's development, entitled Agenda for Change, focusing on energy, infrastructure, agriculture, health, and education. The five-year programme registered some notable successes, including free healthcare for pregnant women, new mothers, and children aged under five, a raft of road and construction projects nationwide, and the completion of the country's first hydro-power station, at Bumbuna, where work had begun nearly 30 years earlier.

After his successful re-election in 2012, President Koroma unveiled an expanded to-do list for the next five years until 2018, as part of the overarching vision for Sierra Leone to become a middle-income country by 2035. In his introductory message, the President recognized that, while progress had been made, key human development challenges still remain unresolved, such as reducing poverty, creating jobs, and providing a social safety net for the vulnerable.

Although the Ebola epidemic has clearly set the timetable back by at least 18 months, the government's commitment to attaining its even more ambitious goals has not wavered one iota: "The Agenda for Prosperity builds on the success of the Agenda for Change," President Koroma confirms, "and lays the foundation to our journey to achieve a sustainable future for all Sierra Leoneans. It focuses on diversification of the economy, managing natural resources, accelerating human development, international competitiveness, labour and employment, social protection, governance and public-sector reform, gender and women's empowerment."

# Dr Kaifala Marah

## *Minister of Finance & Economic Development*

**Q: How has Sierra Leone's economy developed in the last few years?**

**A:** Macroeconomic performance was impressive in 2012 and 2013, but traditional growth sectors have been disrupted in 2014 and 2015 due to lower iron-ore prices and Ebola. The extent of disruption is substantial: GDP growth dropped by 6% in 2014, much slower than the 11.3% projected; the fiscal deficit widened; and revenues fell below earlier projections. With Ebola beaten, the economy is expected to rebound in 2016 with 8.4% growth, predicated on a return to normal iron-ore production.

**Q: What about other macro-economic indicators?**

**A:** Inflation started to accelerate in mid-2014, from 6.4% year-on-year in April to 7.9% in December, reversing the downward trend that started in mid-2011. This reflected disruptions to agricultural production and supplies as a result of quarantines. In the face of continued shutdown of the iron-ore sector, gradual recovery in other sectors contributed to improved revenue collection in the first half of 2015. The budget deficit equalled 4.1% of GDP and unemployment averaged 13% in 2014.

**Q: What were the results of July's United Nations International Ebola Recovery Conference?**

**A:** Pledges, estimated at US\$867 million, were made to support [our] Ebola Recovery Strategy. Most of these constitute old commitments that were repackaged. We are working with the United Nations to establish the Sierra Leone Ebola Recovery Fund [and] encourage development partners to pool these resources. The first nine months of recovery will address maintaining zero infections and providing social support to vulnerable groups. In the medium term, recovery will focus on education, energy, water supply, social protection, and private-sector development.

Q&A



**"Real GDP grew by 15.2% and 20.1% in 2012 and 2013 respectively, driven mainly by mining, agriculture, services, and construction, especially by increased public investment in infrastructure projects."**

## Facts

Sierra Leone has one of the highest levels of religious tolerance in the world

**2003** The Kimberley Process came into effect in Sierra Leone. Since then, all legally won diamonds have been exported in compliance with its requirements

**2012** World Bank survey refers to Sierra Leone as "one of the world's top-ten business reformers"

**2013** Sierra Leone was one of the world's fastest growing economies at 20.1%

**2014** Sierra Leone was recognised as Extractive Industries Transparency Initiative Compliant by the International EITI Board

Since 2002, there have been three peaceful democratic elections, including the transition of power between the two major political parties



## ROLLING OUT THE RED CARPET FOR INVESTORS

*Promotional events at home and abroad, tax incentives for target sectors, and launch of public-private partnership entity all aimed at attracting more capital to the country*

In April 2015, Sierra Rutile, the London Stock Exchange-listed minerals company that controls around 20% of the global market of rutile, said it would invest over €70 million to develop a new mine at Gangama, which should commence operations by mid-2016. Rutile, made up mostly of titanium dioxide, is used primarily as a bright white pigment in paints, plastics, and other applications, as well as in the production of titanium.

Coming more than six months before the country was declared Ebola-free, President Koroma hailed the announcement as, “a turning point as we start to rebuild our economy. One of Sierra Leone’s most important companies has not only weathered the Ebola storm,” he added, “but is now emerging as a leading regional player in rebuilding our country’s future.”

The government is hoping that Sierra Rutile’s commitment will be just the start of a new wave of private investment in Sierra Leone. This July, it hosted an economic growth and development forum in Freetown to welcome local and overseas private- and public-sector investors, including a delegation of 35 companies from the Netherlands. And, at the end of November, it is organising an investment conference in The Hague to reach out to European markets.

During Koroma’s presidency, Sierra Leone has introduced various pieces of investment-friendly legislation to encourage inflows of private-sector capital from abroad. Building on the provisions of the 2004 Investment Promotion Act, which already offered significant fiscal and other benefits to foreign investors, sector-specific incentives have been passed since 2007 to target productive sectors like agriculture, energy, mining, infrastructure, and tourism.

General incentives include relief from income tax and import duties for machinery and equipment; reduced rates of duty for raw material imports; and 100% tax exemption for spending on research and development, training, and social services developments, including schools and hospitals. Investments in certain sectors, like mining, and in Special Economic Zones enjoy additional advantages, such as corporate tax holidays and customs duty exemptions.

Created in 2007, the Sierra Leone Investment and Export Promotion Agency (SLIEPA, see box) provides current and prospective investors with advice and assistance to facilitate doing business in the country. The Public Private Partnership Unit, launched in November 2015, offers information on opportunities for private-sector players looking to get involved in infrastructure projects and other large-scale ventures.

**Oluniyi  
Robbin-Coker**  
*Chairman of SLIEPA*

“Sierra Leone has shown, once again, that its people are both resilient and resourceful. In spite of the numerous challenges it has faced as it progresses along the development curve, the “Back to Growth” message from Sierra Leone illustrates that Sierra Leone is headed towards explosive economic growth in 2016, and you are invited to be part of our story.

As an economy which has been dominated by the export of primary commodities (both mineral and agricultural), there is still plenty of opportunity to diversify. We are poised to receive investment in all segments of the value chain across the tourism, minerals, agriculture, and fisheries sectors, from transportation and logistics to producing vegetable oil, cocoa butter, and canned fish. We can also leverage our market-access preferences to Europe and the United States for the export of manufactured products.

Our strong focus on private-sector participation in infrastructure development and delivery of services, with appropriate regulatory frameworks, has led to successful investments from large multinational companies such as Heineken, Bharti Airtel, Shandong Iron & Steel Company, Heidelberg Cement, Coca-Cola, Bollore, Addax & Oryx Group and Radisson Blu Hotels with many more opportunities available. With SLIEPA, you can be sure the process of investing in Sierra Leone will go smoothly.”



**At a glance**

# Key Economic Sectors

With an economy worth close to €4.6 billion in 2014, according to the World Bank, Sierra Leone intends to sustainably develop its rich natural resources in the short term, while creating innovative solutions to add value in high-growth industries with export potential

## Agriculture



The agricultural sector accounts for approximately 38% of Sierra Leone's GDP and employs 66% of the workforce, most of whom farm on a small-scale, subsistence basis. At present, only around 25% of the country's 5.4 million hectares of arable land is under cultivation.

Staples for domestic consumption include cassava, groundnuts, and rice, but climatic and soil conditions – giving an eight-month growing season and high yields – are also suitable for the cultivation of cash crops like cocoa, coffee, and palm oil. Livestock rearing provides around 6% of sectoral revenues and production is currently insufficient to meet local demand.



## Fisheries

The fishing industry contributes 8% of GDP, but has the potential to become a major export earner. Sierra Leone's 570-kilometre Atlantic seaboard provides easy access to well-stocked waters off the continental shelf. These are home to a variety of high-value, inshore and pelagic species, including shrimp, squid, and fish such as sea bream, snapper, and tuna, worth an estimated \$100 million per annum.

Although production has more than doubled in the last decade, aquaculture remains undeveloped other than for local consumption while offshore commercial activities are largely limited to depths of less than 50 metres in an area up to 45 kilometres from the coast.

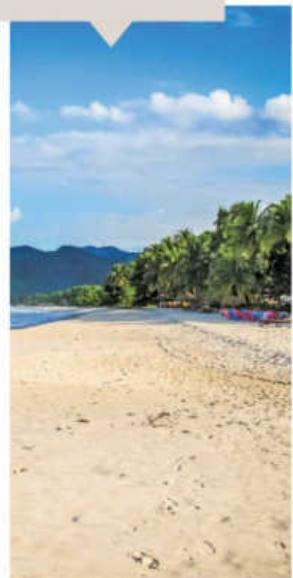


## Mining

In 2013, Sierra Leone was one of the top-ten producers of iron ore worldwide, accounting for 30% of the nation's GDP and half of exports. With reserves of 14.5 billion tons of the mineral, it ranks third globally and first in Africa. The nation also has the world's largest deposits of rutile, sizeable deposits of bauxite, and exported more than 600,000 carats of diamonds and over 330 kilogrammes of gold in 2013 and 2014.

The Mines and Minerals Act of 2009 created a transparent framework for the industry, including provisions for the issue of mining licenses and a revised fiscal regime.

## Tourism



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With over 360 kilometres of white-sand beaches, protected forest reserves and 18 national heritage sites exploring its slave trade past, Sierra Leone has a host of attractions for tourists. Three hours from Lagos, Africa's biggest city, six from Europe, and eight from the U.S., it is also easy to get to.

One global hospitality brand already operates in the country and Hilton will open their first hotel in 2017. Air Côte d'Ivoire, Air France, Brussels Airlines, Kenya Airways, and Royal Air Maroc all offer regular services, with British Airways expected to resume flights soon. There is room for considerable growth in the sector.



## Infrastructure

The government is committed to upgrading Sierra Leone's transportation infrastructure, much of which was damaged during the civil war and remains insufficient for current and future needs. The budget to deliver infrastructural provisions of the Agenda for Prosperity adds up to €4.8 billion, leaving a sizeable funding gap as only €2 billion is expected to come from state coffers.

The national road system covers 11,000 kilometres, including local networks and unclassified tracks. Freetown's Queen Elizabeth II Quay is the main gateway for trade, while smaller ports at Nitti and Pepel are used by the mining industry. Sierra Leone currently has one international airport at Lungi.



## ICT



## Energy

Leveraging its link to the 17,000-kilometre ACE (Africa Coast to Europe) submarine cable since 2013, Sierra Leone is rolling out a nationwide terrestrial fibre-optic network, scheduled for completion in 2017. It will not only provide faster and cheaper connectivity for the population, but has the potential to position the country as an innovator in information technology. The government also intends to improve ICT skills through education.

Mobile telecommunications is one sector where private-sector companies have already made inroads, competing with state-owned Sierratel, which is earmarked for privatisation. Five networks now reach 44% of the population, although internet penetration remains low.



## Petroleum

When the Koroma government came to power in 2007, Sierra Leone had just five megawatts of functioning electricity generation capacity. Today, the sector produces 100MW, a 20-fold hike but only enough to supply the needs of 10% of the population. While reliability has improved, especially in the capital, energy costs remain high and rural areas continue underserved.

At present, about 50% of the national energy mix comes from hydroelectric power, although this is affected by seasonal rainfall, with the remainder thermally generated. Distribution remains a challenge, with almost 40% of the power generated lost by the outdated transmission network.

**"We must ensure we are globally competitive and our economy is diversified to promote inclusive, green growth that is beneficial to all Sierra Leoneans"**

*President Ernest Bai Koroma, Agenda for Prosperity*

# Opportunities across the economy

*Sierra Leone is forecast to post positive GDP growth in 2016, fuelled by the resumption of ongoing projects and inflows of new capital into promising industries*

Post-Ebola, Sierra Leone is hoping that major investment projects, announced prior to the outbreak and on hold for the last year and a half, will now resume. At the same time, there is scope for private-sector players to get involved in new ventures across the economy, from productive sectors like agriculture, transportation, and tourism, to infrastructure, especially in the energy industry, and the provision of social services.

The government's agricultural strategy involves improving irrigation systems on 300,000 hectares of land, building new roads from production centres to markets, facilitating access to finance for rural development, diversification into new segments such as livestock, and promoting large-scale private investment to develop commercial agribusiness and increase productivity along the value chain.

In addition to low operating overheads, including land leases, water rights, and labour costs, investment incentives on offer for eligible projects include income-tax holidays for up to 10 years, reductions in withholding taxes on profits, and exemption from import duties on inputs such as equipment and chemicals.

According to SLIEPA, refining and processing crude palm oil and the production of fruit juice and concentrates are two areas with major export potential. Existing oil palm plantations across the country could produce much higher yields with new investment, while there is scope to revitalise local groups of smallholders in the fruit-growing sub-sector.

In the fisheries industry, processing and canning to meet demand from the domestic and export markets is also seen as the best way to add value to the country's catch. The construction of harbours along the coast and a new processing complex in Freetown to serve as a storage and transhipment hub could be developed as public-private partnerships.

In infrastructure, the administration has set a list of targets for 2018, such as providing access to clean water for 74% of the population by 2017, building and repairing 3,700 kilometres of the national road network, and developing a multimodal port and rail hub in Freetown capable of handling up to 50 million tons of minerals for export. The government is developing new models of cooperation to make projects viable with the support of multinational institutions and private-sector players. Incentives include an exemption from income tax for 15 years for projects worth more than \$20 million (€18.7 million).



© MICHAEL DUFF

China Railway International are already at work on the construction of a new airport at Mamamah, 60 kilometres from Freetown, to complement the recently upgraded Lungi International Airport which is located north of the capital, across the Sierra Leone river. Financed by a €290 million loan from China Exim Bank, the project should be completed by 2017, according to government sources.

In April 2014, the Carlson Rezidor Hotel Group opened the Radisson Blu Mammy Yoko hotel in Freetown, the first five-star hotel in Sierra Leone. Close by, in the upscale Aberdeen neighbourhood, work has recommenced on the Hilton Freetown Cape Sierra, originally scheduled for completion in 2014. The €90-million hotel, which will have 200 rooms and suites, an infinity pool, gym, and conference facilities, now aims to open its doors by the start of 2017.

In the energy sector, the goal is to reach a minimum of 1,000MW of generating capacity by 2018 from a mix of fossil fuel and renewables, although this will require investment of more than €3.25 billion. The government has identified 27 sites suitable for hydro-power stations that, together, could provide over 1,500MW, while solar could account for up to 20% of the total. The Ministry of Energy is open to private-sector participation in both transmission and distribution to develop a new national grid.

The construction of a €379-million project to develop Phase II of the Bumbuna Hydroelectric Plant by partners Endeavor Energy and Joule Africa is also expected to commence by 2016. Located on the Seli river in Tonkolili District, Bumbuna currently supplies 50MW of power, but the addition of six new turbines and a new dam upriver at Yiben aim to increase capacity fivefold to reach 252MW.

For further information on government initiatives or investment opportunities please contact:

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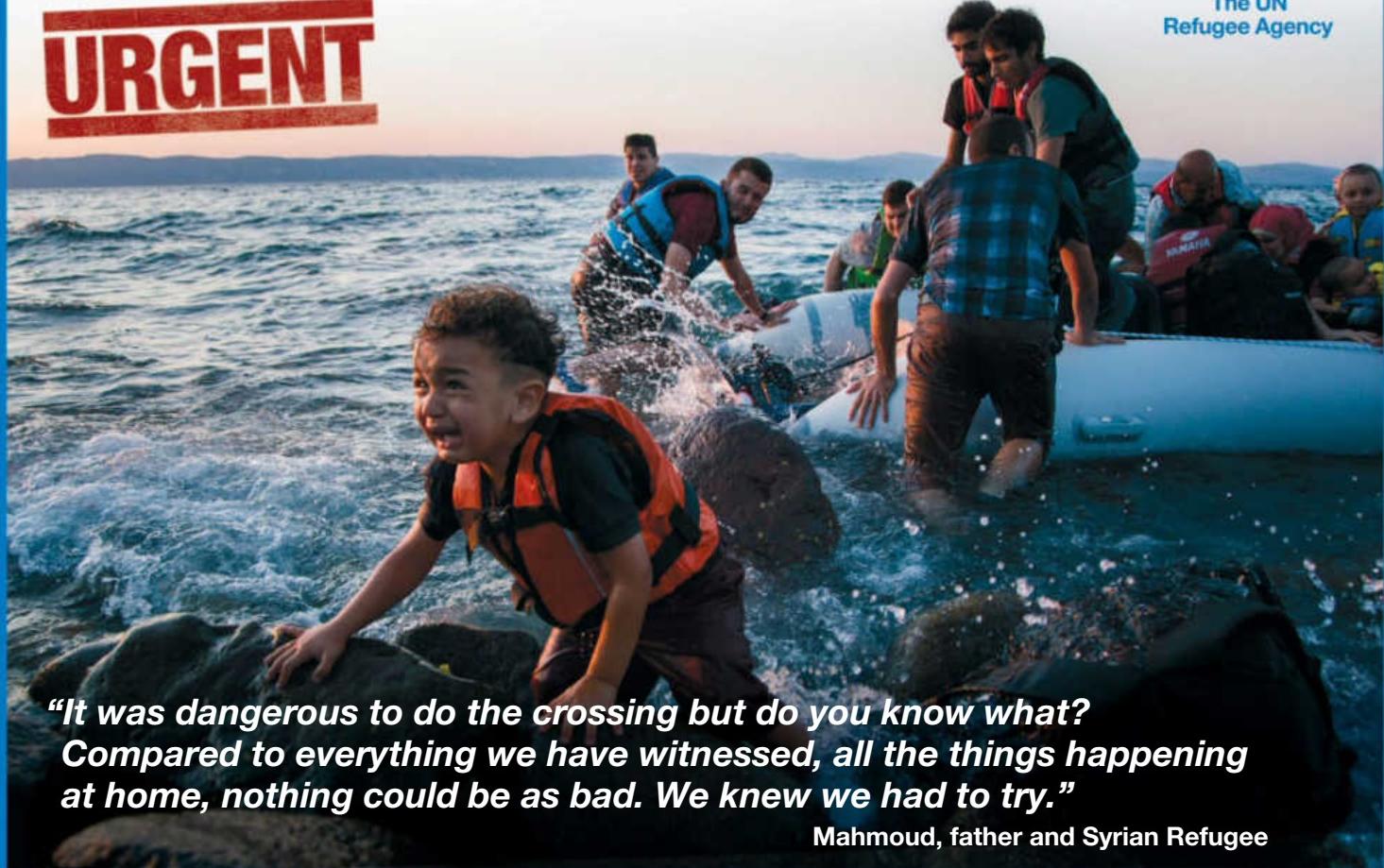
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# REFUGEE CRISIS IN EUROPE

FAMILIES FORCED TO FLEE THEIR HOMES

## URGENT



***"It was dangerous to do the crossing but do you know what?  
Compared to everything we have witnessed, all the things happening  
at home, nothing could be as bad. We knew we had to try."***

Mahmoud, father and Syrian Refugee

Over 400,000 people have crossed the Mediterranean during 2015, undertaking unthinkable journeys from countries like Syria, that have been torn apart by war and persecution.

These families are fleeing for their lives, risking the treacherous sea and land crossings. Many having no choice but to board over-crowded, flimsy boats to give their children a chance of safety. For some, this desperate journey will be their last. Almost 3,000 people have drowned trying to reach safety in Europe. The crossing is dangerous but for many families making this journey is the only choice they feel they have.

**UNHCR is on the ground providing life-saving assistance but we need your help.**

You can help provide shelter, food, water and medical care to vulnerable families arriving in Europe.

With so many in need and as more continue to make this journey, your donation today is vital and will help UNHCR to save lives and protect families who have been forced to flee their homes.

**\$120 can provide emergency rescue kits containing a thermal blanket, towel, water, high nutrient energy bar, dry clothes and shoes, to 4 survivors.**



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# NEW WORLD



HYDROGEN

INNOVATION

SPACE

ENVIRONMENT

CLIMATE

WILDLIFE

GOOD SCIENCE

## HUMANS BITE BACK

# Scientists have genetically modified mosquitoes to be malaria-resistant

A BETTER BUG:  
The UC Irvine team worked on the genome of *Anopheles stephensi* mosquitoes, which are a main vector of malaria in India. But they believe the technique would work in other species as well.

**MALARIA WILL** strike more than 200 million people this year, according to the World Health Organization, and will kill nearly half a million. Although the disease can be treated, in some parts of the world, the medicines needed are often unavailable. And worse, the parasite that causes malaria is becoming more and more resistant to the drugs we have to fight it.

That's why several research groups are working on genetic modifications to mosquitoes that would prevent them from spreading the parasite. The latest advance comes from the University of California, Irvine, which has created a mosquito that not only doesn't transmit malaria but also passes on this trait to 99.5 percent of its offspring.

This so-called "gene drive" mechanism is quite an achievement, since many traits inherited in a more typical fashion go to only a fraction of an organism's offspring, says researcher Anthony James. His team used a gene-editing technique called CRISPR to insert two genes into the insect's genome to confer malarial resistance. They used two modified mouse immune

genes, which bind to the malaria parasites and prevent them from recognizing their host and moving around in the mosquito's body. "You can think of it as [being] blinded," James says. As a result, the parasite cannot get into the animal's salivary gland and, therefore, doesn't make it into humans when the mosquitoes bite. And, given the high rate of inheritability, the resistance would theoretically spread quickly throughout a population once introduced.

James says the innovation needs to be tweaked slightly before being applied in the field, and introducing genetically modified organisms into the wild would require regulatory approval from foreign countries where malaria is endemic. There is some concern, for example, about what might happen if the gene drive were to make its way into another organism. Perhaps an undesirable gene might spread through a whole population of animals, wiping out a species. But this seems unlikely, James says, and at this point the potential benefits of helping to stop malaria appear to outweigh the risks. □



## AUTO'S H-BOMB

# Japan's largest automakers are betting big on an unproven technology. But are hydrogen fuel cell cars the future or just hype?

"WE ARE GETTING ready to embrace a hydrogen society," said Tokuo Fukuichi, president of Lexus International, as he unveiled the brand's new concept car at the Tokyo Motor Show in late October. Sleek and shiny, the LF-FC could have been just another of the many luxury sports cars glittering under the convention center's fluorescent lights. But the overflow crowd didn't come to look at sheet metal. The real draw lay closer to the chassis: a fuel cell stack that powers the car by converting hydrogen into electricity. Unlike gasoline engines, which send a noxious cocktail of gases out the tailpipe, fuel cells emit nothing but water vapor.

Lexus, a division of Toyota, was not alone in using the Tokyo stage to promote a hydrogen-powered future. The parent company showed the FCV Plus, which plugs into a local power grid to generate electricity for a community, while Mercedes-Benz displayed its Vision Tokyo minivan, which runs on a combination of hydrogen and battery power. Honda presented a close-to-production version of its Clarity Fuel Cell, expected to go on sale next year, and Toyota brought its Mirai (the Japanese word for "future"), which launched in Japan in December 2014 as the world's first mass-produced fuel cell vehicle and began deliveries in California this past October.

The enthusiasm for fuel cells goes beyond their futuristic sci-fi appeal. Environmentalists have called to cut dependence on oil, and world leaders are now deliberating on how to meet June's G-7 summit agreement that promises to phase out fossil fuel by the end of the century. Achieving that goal will require a massive remake of the global auto fleet. But the technology for doing so is at a crossroads.

Electric vehicles, such as the Tesla Model S, Chevrolet Volt and Nissan Leaf, have gotten the glory as early alternatives to the internal combustion engine, but several carmakers, led by Toyota and Honda, say fuel cells will change how we drive, letting us bypass gasoline entirely and travel for longer distances than electric vehicles would before they'd need to recharge. Instead of gas, drivers will fill up on hydrogen at their local refueling station and go more than 300 miles on a single tank. Toyota already has 1,500 orders in Japan for its first 400 Mirais, and the waitlist stretches two to three years.

The call for hydrogen assumes, however, that fuel cell drivers will live near a hydrogen fueling station. Right now, that's pretty unlikely. In the U.S., there are only 15 of them: 13 in California and one each in Connecticut and South Carolina. And only four of the stations in California operate at the retail level, accepting credit card

BY  
JACLYN TROP  
 @jaclyntrop



**READY TO LAUNCH:**  
The Mirai, a new fuel cell car made by Toyota. Even though it's built on fairly untested technology, the Mirai is already popular: 1,500 people placed orders for the first 400 cars for sale.

payments. The remaining stations are part of a legacy network that can be accessed only by using a code from the carmakers (Toyota, Honda, Hyundai, Mercedes and General Motors) that have put small, experimental fleets on the road over the past 10 years.

On the other hand, the growth of the refueling network is quickly accelerating, in large part because the California Energy Commission has earmarked hundreds of millions of dollars to develop the network and hydrogen storage systems. By the end of 2016, California will see 46 stations open. That's still well short of the 100 stations—located in five early-adopter regions, including Silicon Valley and the West Los Angeles and Santa Monica area,

## TOYOTA HAS RECEIVED 1,500 ORDERS FOR THEIR FIRST 400 MIRAI'S.

and clustered so they're at most six minutes' driving distance apart—the commission has determined the state needs to make the technology viable, but it's a start.

Meanwhile, other states are beginning to support fuel cell vehicles. The governors of Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island and Vermont have committed to putting more zero-emission vehicles,



and the refueling infrastructure to support them, on the road by 2025.

Carmakers are chipping in too. Last year, Honda and Toyota funded the startup FirstElement Fuel based in Newport Beach, California, with \$13.8 million and \$7.3 million, respectively, to help cover the cost of stations in California. Toyota has also committed to funding 12 stations along the New York-Boston corridor. But "if the stations don't come as we expect," says Craig Scott, Toyota North America's national manager of the Advanced Technologies Group, "we're all going to be sweating."

The stakes are even higher in Japan, where Prime Minister Shinzo Abe has promised to show off "a hydrogen society" for those attending Tokyo's 2020 Summer Olympics. The country is leading the global charge by offering subsidies of up to \$25,000 to consumers purchasing fuel cell vehicles and encouraging its government agencies to order them for their fleets. But even Japan is likely to fall short of its fuel cell goals. The country wanted to build 100 stations by March; 28 are up so far, and 53 more are anticipated to be completed over the next six months.

As with much new technology, fuel cell vehicles may live or die on the dent they make in people's wallets. Without the sort of subsidies offered by Japan, the prices for fuel cell vehicles could cause sticker shock—even though the cars are less expensive than the Tesla Model S, whose base version starts just below \$70,000. In the U.S., the Mirai starts at \$58,325 (including destination fee). Honda said the Clarity FCV will be priced at around \$63,000 in Japan, but it hasn't announced the price for the U.S. The cost of the components is likely to decrease as automakers produce more volume, but for now the cars are a luxury buy.

Toyota has allotted close to 1,000 units for the U.S. launch of the Mirai and says it expects U.S. deliveries to reach 3,000 by the end of 2017. In addition to California, it'll sell the Mirai in

five states in the Northeast, despite the fact that the region currently has only the one Connecticut station. Honda's aspirations are slightly smaller, with an initial target of 200 units for the Clarity Fuel Cell in Japan. It has not announced a launch date for the U.S. Meanwhile, last year, with an apparent eye to the future, Hyundai began leasing a fuel cell version of its Tucson compact SUV that travels 265 miles on a single tank to several dozen customers in Southern California. "We have mass-production capabilities to meet future market demand," says a Hyundai spokesman.

The East Asian automakers' decision to invest billions of dollars in researching and building hydrogen-powered vehicles is at odds with the approach of others that have championed battery power instead. Tesla Motors CEO Elon Musk is a vocal critic of fuel cells, famously deriding them as "fool cells" and a marketing ploy that's unlikely to gain traction. But those on the side of fuel cells have their own qualms with battery-powered autos: "The issue for the EV is that it's costly, heavy and takes a long time to charge," says Mitsuhsisa Kato, Toyota's executive vice president of R&D. Toyota briefly partnered with Tesla to produce an EV version of its RAV4 SUV, but sales were disappointing. Now Toyota is encouraging new entrants to the fuel cell mar-

## PRIME MINISTER SHINZO ABE HAS PROMISED TO SHOW OFF "A HYDROGEN SOCIETY" TO VISITORS AT TOKYO'S 2020 SUMMER OLYMPICS.

ketplace, opening its more than 5,600 fuel cell patents to other companies and hoping to benefit from a network effect that will create a density of fueling stations that attracts more customers.

Competitors are watching the Japanese carmakers from the sidelines. General Motors has been developing its own fuel cell prototypes, while Nissan and Daimler AG (Mercedes's parent company) are partnering on a design that Nissan CEO Carlos Ghosn said could be on the market as early as 2020. "There's that old joke that fuel cells are always five years away," says Devin Lindsay, an analyst for IHS Automotive in Southfield, Michigan. "But now it looks like we're a lot closer." ■

# Rebuilding the Silk Road: a new era of global trade

Perfectly situated at the intersection where East meets West, Georgia's Silk Road Group is helping transform the region into a hub for global trade

Stretching over 4,000 miles from the historic Chinese capital of Chang'an through to the heart of continental Europe, the Silk Road played a pivotal role in the development of countless civilizations. Bridging the gap between the Eastern and Western worlds, this vast network of trade routes facilitated the exchange of goods, technologies and culture between some of the greatest empires in history. Now, more than 2,000 years after the Han dynasty began using the route to export silk to Central Asia, Georgia's Silk Road Group is reviving this ancient network to transform the region into a hub for global trade.

"Silk Road Group's vision was to take advantage of Georgia's location on the historical Silk Road," explains Group Chairman, Giorgi Ramishvili. "The vision was to create new economic ties and to revitalize all the potential connections that Georgia had in the region. We thought that Georgia could be interesting for Europe, the U.S. and to any country, as Georgia is a gateway and the easiest entrance to the region for many reasons."

Nestled between the Black and Caspian Seas, Georgia sits on the intersection where Europe meets Asia. As the most stable country in the region, the former soviet republic is a natural hub for trade and tourism, as Mr. Ramishvili explains.

"Georgia is the easiest country in the Caucasus to do business, according to the World Bank," he says. "The country is also great for tourists because of our cuisine, our hospitality. It seems almost perfectly made for people from abroad to come and explore the region from here. If any company from any country has a vision that covers the entire region, they can choose Georgia as their base and be successful."

He adds: "Georgia is one of the safest places not only in the region but in the world, which is a very important point because without safety you can do nothing. To accomplish this considering the conflicts in the surrounding areas is not easy."

By taking full advantage of its position as a gateway between East and West, Silk Road Group has grown into one of the leading oil and fuel transport and trading operators in Central Asia.

"Since we started operations, we have covered all this region including Central Asia, South Russia, Iran, Afghanistan, Kazakhstan, and China," says Mr. Ramishvili. "This was quite a challenge because we had to face different types of rail infrastructure. Now railroads are standardizing and this is what will allow us to decrease the transit time from China to Europe to 15 days."

He adds: "I also proudly mention that we were one of the first companies to use ferries to transport crude oil across the Caspian Sea to Georgia. We understood this excellent way of transit many years ago, and saw that it was a lot faster than taking the roads."

In 2004 the company began diversifying its business – expanding its interests into other sectors, including telecommunications, hospitality, real estate, banking and energy. Since 2009, the company has also been a major transportation agent for suppliers of aviation fuel and container cargoes to the Joint Forces in Afghanistan. To date, it has invested over \$500 million into the Georgian economy and created 7,000 jobs.

"As we did business outside Georgia this gave us a lot of experience and allowed us to create a very good network of partners and customers. So by the time privatization started 10 years ago, we were more than ready to start intensive business activities in Georgia," says Mr. Ramishvili. "Silk Road Group is an example of a holding that operates successful businesses in Georgia. We have already directly invested \$500 million in the country –

**"Georgia's potential has been vastly underestimated, and only time will reveal the full capabilities of this driven nation. We are prepared to work with leading Western investors to forge strategic partnerships in key business areas."**

Giorgi Ramishvili, Chairman,  
Silk Road Group



**Silk  
Road  
Group**

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and we are very proud of this – not only because it's our home, but because it is a great place for doing business."

Last year, the Georgian government signed a new trade agreement with the EU, opening a huge network of possibilities in the European market. Mr. Ramishvili hopes this will create even more opportunities for the Silk Road Group.

"Culturally speaking it is like coming back home as Georgia was a part of the Byzantine Empire," he says. "It is very interesting to see how we survived all this influence from different cultures and maintained roots and traditions. So this returning is a big chance that represents a historical moment for us."

The Georgian government shares Silk Road Group's vision for the region, and has become deeply involved in developing the region's potential. The country's Minister of Foreign Affairs Giorgi Kvirikashvili, recently returned from China, where he was working on new strategies to reduce the time it takes to transport goods from China to Europe.

"We appreciate very much the efforts of Mr. Kvirikashvili and the government in general because a single private company cannot change the conditions in all those countries along the Silk Road," says Silk Road Group's partner Alex Topuria. "It doesn't matter what we achieve in Georgia if in Azerbaijan, Turkmenistan or Kazakhstan the tariffs are very high."

He adds: "Our government has been very active in this matter. The first trip that was done between Asia and Georgia was done in 12 days, which was a very good result. The turnover keeps growing and of course it represents an excellent connection of East and West, with Georgia right in the middle."





## NEVER SAY NIMMER

Two brothers plan to turn Berlin's filthy Spree Canal into a giant swimming pool

**THE RIVER SPREE** flows northwest for 250 miles from the Lusatian Mountains, near the Czech border, to central Berlin. From there, at the eastern tip of Spree Island, it splits like a wishbone into two arms and heads west. Tourist boats frequent the arm that is wider and passes popular destinations like the DDR Museum, which shows what life was like in East Germany under Soviet rule. The other arm, Spree Canal, is narrower and has been largely out of use for more than a century. The area around it is generally residential. And several times a year, to prevent the sewers from flooding during rain, pipes redirect untreated sewage into the canal.

Tim and Jan Elder, brothers who grew up in West Germany, envision turning that polluted spot where the Spree splits into the starting point for what they are calling “Flussbad Berlin”: a mile-long system of plants and pipes that would filter the water and convert a stretch of the canal into a giant swimming pool. The Flussbad project (the word means “river pool”) sounds ambitious, even quixotic, but last year the German government granted the brothers \$4.8 million to test their new filter design.

On a rainy day in November, the Elders meet at a small pedestrian bridge near the river’s fork. A horde of teens have just vacated the spot, leaving behind a half-dozen coffee cups. Below the bridge is the Historic Harbor, where antique boats with names like *Elisabeth*, *Libelle*

and *Andreas* bob in the canal, peppered with fallen yellow leaves. Tim and Jan are wearing blue jeans and identical navy raincoats, which Jan insists he bought first. Call it the uniform of Realities:United, the art, architecture and technology studio they run.

Tim says the idea for Flussbad came in 1997, when he and Jan worked near the Spree. They built a riverside discotheque and man-made beach; *The New York Times* said the makeshift club had “a jagged energy, an edginess, an openness that leave[s] a piece of formerly eastern riverside property in the hands of an association of artists.” The author also mentioned seeing “several young men urinate into the dark water.”

“We experienced how super attractive people found [it] to be with the river,” Tim says of that venture. That got them imagining how the forgotten waterway slicing through Berlin might become a recreational Eden at a time when the city was becoming congested and more built up. The Elders wanted to give people a way to jump in the river, but many of those people were skeptical, telling them the idea was “sufficiently unrealistic” and “totally nuts.”

In the almost two decades since, cities around the world have embraced their waterways and postindustrial spaces, part of a global push for sustainable development. “What you see in the Flussbad project is echoed in projects worldwide: a focused intervention that respects that



BY  
MAX KUTNER  
[@maxkutner](https://twitter.com/maxkutner)



**GRAND SPREE:** In an architectural rendering, locals can be seen swimming in the Spree Canal. Flussbad would create a swimming area as big as 17 Olympic-size pools.

which has been created by previous generations, benefits from natural mechanisms and reinvigorates open spaces for public use," says Rolf Soiron, chairman of the board of the LafargeHolcim Foundation for Sustainable Construction. In 2011 and 2012, LafargeHolcim gave the Elders \$150,000 for Flussbad.

"When we invented it, we didn't see anything that was close," Tim says. Now, Jan adds, "everybody wants to be at the river." In New York City, for example, + Pool aims to be "the world's first water-filtering floating pool," the project designers have said, with special walls that filter water from the East River. (It remains in development.) Swimmers have taken to rivers in cities around the world—even in Basel, Switzerland, where the 1986 Sandoz chemical spill once poisoned the waterway. But Jan says, referring to Flussbad, "As far as I understand,

it's the only project which at that scale really changes the river itself."

Industrial mills used to occupy both sides of Spree Canal, which was a popular shipping lane until 1894, when the city demolished some of the mills and built a lock in the main arm of the river, making it easier for ships to use that route. Decades later, the city demolished a separate lock on the canal, the Elders say, making it nearly impossible to traverse. Since then, the canal has sat mostly unused, still apparently costing Berlin millions of dollars a year to maintain. Though the Spree appears black from afar, when you look down at it close up, it's possible to see to its bottom. But because of the sewage system that dumps human waste into the canal without warning, swimmers risk nausea, vomiting and diarrhea.

In November, the Elders published a 99-page

**NATURE'S CHLORINE:** The plan would turn a section of the canal into a natural zone, with a plant-and-sand system that naturally filters pollutants so that Berliners down the canal can swim in clean water.

+





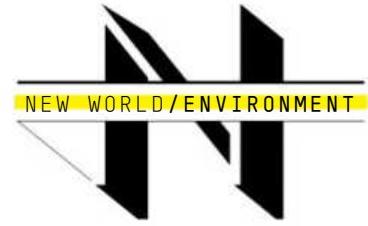
feasibility study on how to make the Spree safely swimmable. Flussbad will consist of three sections: a natural zone that would attract fish and wildlife and have recreational spaces; a filtration zone; and a 2,788-foot-long swimming zone through one of the city's most tourist-heavy areas. At the end of the stretch, a weir would keep the unfiltered water from flowing back into the swimming pool.

The most important piece of that puzzle is the plant-and-sand filtration system the brothers have devised (with the help of some engineers). They'll start by digging holes in the river bottom and filling them with permeable sand. As water passes through the sand, a microchemical process cleans it. Planted reeds help keep the sand in place. It's an open system that continually takes in water, cleans it and releases it. Typical filtration systems function more like giant coffee filters, but they need periodic cleaning or replacing; this innovative plant-and-sand filter is all natural and requires no energy. Pollutants get "digested" by what Tim describes as "a film of microlife" around the sand, including bacteria. The system would be able to filter 132 gallons per second.

The process may sound simple, but it requires more than digging holes and planting reeds. Because the Spree tends to flood, Flussbad must also incorporate a complex system of pipes that can allow river water to bypass the filter (and temporarily put swimming on hold). And unless the city updates its sewer system, the project must also implement a drainage system to redirect sewage that would otherwise flow into the canal. It's much more than just "making a garden in the river," Tim says.

Above the filtration zone would be a "natural" zone, which could attract insects like dragonflies and fish such as eel, ide, perch, pike, rudd and silver bream, according to the feasibility study. Currently, Jan says, "wildlife has basically no chance" to survive there. Along the route would be low-lying artificial jetties, lookout spots and bicycle paths.

From the filtration zone, the water would flow into a swimming area the length of 17 Olympic-size pools. That section would have big stairways to the water from the street level, as well as possibly dressing rooms, showers and lockers. The system would flush out the pool water once a day to prevent the formation of blue-green algae, bacteria that can release toxins. This zone would span from the Schlossplatz (where the Humboldt Forum, a re-creation of a 500-year-old Baroque palace that the German Democratic Republic demolished in 1950, is under construction) to



the Bode Museum. For more than half a million Berliners, Flussbad would be the closest natural body of water in which to swim, according to the project's website.

So far, Flussbad has been funded by prize money, grants and individual donations. The Elders won't disclose how much the project will cost—their current estimate could dissuade politicians from supporting it, they say—but they hope the government will foot most of the bill.

Having figured out the science and (most of) the financing, the brothers now face their last obstacle: Berlin bureaucracy. Altering major city infrastructure will require wading through lots of red tape, especially since the canal passes Museum Island, which is part of Spree Island and is a UNESCO World Heritage Site. Critics

## "IT'S THE ONLY PROJECT WHICH AT THAT SCALE REALLY CHANGES THE RIVER."

have already bashed the plan to cut stairways into the canal walls, portions of which date back to the 19th century and were designed by famed Prussian architect Karl Friedrich Schinkel.

In public discussions, Tim and Jan have observed that younger Berliners seem more open to the project than the city's older citizens because they understand it is "a substantial aspect of future life," Tim says. Older people, on the other hand, seem to have a harder time understanding "that this is not just a fun-and-nuts thing."

In July, the Elders hosted a swimming competition in the still-unfiltered Spree to draw attention to their project. Around 120 swimmers, wearing yellow bathing caps, jumped into the black water. Tim and Jan each took a dip but spent most of the day watching from the sideline, towels in hand. They both concede they cannot swim. □



Fritz Hoffman/Redux



DOWNTIME

SPORTS

ART

URBAN RENEWAL

TRAVEL

STYLE

DINING

## **CESSPOOL OF DREAMS**

An effort to restore the most polluted water in America says plenty about what we've done to cities in the past—and what we hope to do to them now

+  
**LOCH NASTY MONSTER:**  
Kayakers navigate the murky waters of the Gowanus Canal in Brooklyn, New York. Built in 1869 as a mode of transport, the waterway was named an EPA Superfund site in 2010.

**NEAR THE BANKS** of the Gowanus Canal, an exceedingly polluted waterway that wends through brownstone Brooklyn for 2 miles, you can buy a deer fetus for \$230 at the Morbid Anatomy Museum. The bruised little corpse was not fished from the canal, though the bodies of mafiosi used to routinely end up in these murky waters. So did those of dogs and cats.

Also on the canal, where Lenape natives once caught oysters bigger than Minnesota, is a Whole Foods, probably one of the very few in the nation to sit atop a Superfund site. A restaurant called Little Neck is well-regarded for its bivalves; these did not come from the Gowanus, which is rife with toxic chemicals and human waste.

Somewhere near the Gowanus rest the bodies of several hundred soldiers from Maryland who fought off the British during George Washington's retreat in the Battle of Long Island. Histo-

rians think the Marylanders are buried beneath an empty lot, but the owners of the lot won't let them dig it up, so the mystery remains.

In 2007, a Minke whale swam into the mouth of the canal. Locals called it Sludgie. Sludgie languished for two days, then died, apparently from hitting its head on a dock. In 2013, a dolphin wandered into the canal. It also died. In 1950, a shark swam into the Gowanus. It was shot dead by police officers.

In April, an environmental activist named Christopher Swain swam the Gowanus to highlight the waterway's plight. Though he wore plenty of protective gear, his mouth was in direct contact with the canal. "It tasted like mud, poop, ground-up grass and gasoline," Swain said after emerging. "It's just like swimming through a dirty diaper."

The canal may well be a dirty diaper, but it's

BY

ALEXANDER NAZARYAN

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also a case study in urban reclamation, one that could have implications from North Hollywood to the South Bronx. As people return to American cities, communities are cleaning up rivers that, polluted by industry and then neglected during suburban flight, have been turned into filth-filled troughs. The impetus is economics as much as environmentalism, with water access having become an urban amenity as coveted as basement wine cellars and climbing walls. It's in our genes. The Neanderthal craved being near rivers as much as the graphic designer in Austin; he just paid a lot less for it.

ON A MURDEROUSLY hot Friday afternoon in August, I took a tour of the Gowanus with Joseph Alexiou, author of the recently published *Gowanus: Brooklyn's Curious Canal*. As far as either one of us can tell, it is the first book-length treatment of the canal. A licensed New York City tour guide who grew up in Long Island, Alexiou is short and energetic and given to cursing with great frequency

"Not everything can be fucking luxury," he said, in reference to the residential buildings now slowly rising along the banks of the Gowanus. "That's not how the world works."

A little later, we stood on the Carroll Street Bridge, a flat span with wooden slats that is one of the last four bridges in the country to retract for passing ships. We looked down into the water, about which the phrase "It looks like shit" can be used in the literal sense. A single maple leaf flowed past, and Alexiou joked that it was the first sign of autumn. But then another shape emanated from underneath the bridge, a translucent thing resting languidly on the surface. A sea creature emerging from the depths? Alas, no. This is the Gowanus, not the Great Barrier Reef. "Look at that," Alexiou said with awe. "What the fuck is that? That is a king-sized condom."

Indeed it was. Someone somewhere in Brooklyn flushed it down a toilet, and the prophylactic

entered the ancient sewers of Brooklyn, some of which date back to the Civil War. When it rains, the stormwater enters those sewers, which cannot handle the increased volume, so some of the waste and the surface runoff is dumped into the Gowanus via 11 pipes that deposit 370 million gallons of "combined sewage overflow" into the canal per year.

The Gowanus is not only the most polluted waterway in America but perhaps the most intractable. Fix this and you can fix anything. Many a city has been remade in the image of New Urbanism, Brooklyn among them. But not the Brooklyn directly abutting the Gowanus. With its filth, its neglect, its decay, the Gowanus is a reminder of what we have done to our cities, the indelible scars we have left on the landscape, scars that cold-brew coffee shops and co-working creativity hives cannot fix.

Restoring rivers has often seemed a way to save entire cities, such is the significance we place on water and its health. While the Seine has always been a destination for those visiting Paris, the river itself could, in years past, seem remote from the city—civic symbol more than civic participant. That has been changing with the *nouvelles berges*, a project to return the austere embankments to the people. There are now, the BBC reported, "restaurants and bars, concert spaces, running tracks, a massive black-

IT TASTED LIKE MUD,  
POOP, GROUND-UP GRASS  
AND GASOLINE. IT'S  
JUST LIKE SWIMMING  
THROUGH A DIRTY DIAPER.

board for children to scrawl on, cabins for rental where you can eat with friends, or hold business meetings." There have even been promises of a swimmable Seine, though that may be an instance of Parisian pride outpacing the realities of public health.

Unwilling to be outdone by its continental rival, London is holding an international "Back to the River" competition that has solicited entries for a new vision of the Thames, a river settled by the Romans 2,000 years ago. Meanwhile, in Germany some want to "renaturize" a dirty stretch of the River Spree flowing through central Berlin, turning part of it into a swimming pool.





**TOXIC AVENGER:**  
Christopher Swain,  
an environmental  
activist, emerges  
from the depths of  
the Gowanus, where  
he spent nearly an  
hour on April 22.

Gowanus presents an especially complex challenge. Just a half-mile from its banks, residential properties routinely sell for millions of dollars. If current efforts by the Environmental Protection Agency (EPA) and others come to fruition, and the floating poop logs make way for otters and marsh grasses, the Gowanus could become the next High Line, the abandoned elevated railroad turned into a park-in-the-sky that revitalized the West Side of Manhattan and became a showcase for green ingenuity that has been replicated the world over. Or the Gowanus could languish in a bureaucratic inertia fostered by developers, community activists, environmentalists and politicians, all of whom want something but not quite the same thing. Already a horror story, the Gowanus serves as

a cautionary tale for those who think that every city, from Akron, Ohio, to Juneau, Alaska, is ready to become the next Austin, Texas, or the next Portland, Oregon, or the next whatever.

**MOST EVERYONE** agrees that the Gowanus needs to be cleaned up. But the tricky thing is that the Gowanus is not some inert piece of land, like most Superfund sites, waiting patiently for “remediation.” The EPA’s plan for the Gowanus is ambitious and, like most ambitious plans, very expensive. At a cost of \$506 million, the agency will excavate an estimated 588,000 cubic yards of contaminated sediment, then put a cap on the sediment that remains. The EPA is also requiring the city to build retention tanks to handle sewage overflows. That could, the agency estimates, reduce the amount of “sewer solids” heading into the Gowanus by as much as 74 percent.

Others are taking more modest approaches. DlandStudio, the Brooklyn-based architecture and design firm, is starting a demonstration site for the Gowanus Sponge Park on a dead-end street abutting the canal. The sponge part is literal, with native grasses intended to capture surface runoff, preventing it from flowing into the Gowanus or into sewers and, from there, into the canal. The water would be remediated in wetland basins before making its way into the canal. With the proper funds and political will, the Gowanus Sponge Park would be extended as a kind of protective green sleeve around the canal, opening the banks to public access while cleaning up the water.

For now, the Gowanus remains pretty dirty and kind of cool. Every place has a history, but the canal has something rarer: a mythology. To hang out near the Gowanus is to announce an affiliation with the unseemly past, as opposed to the comfortable house-spouse-and-kids future.

I ventured to the Gowanus on a late summer night. Couples lingered on the Union Street bridge, while a crowd gathered in front of Ample Hills, a popular ice cream parlor known for the freshness of its ingredients.

I went into Swan Dive, the new beer garden right on the canal’s edge. I lingered on the outskirts of the space, leaning over the railing and looking down at the water below, ominous and obsidian. The secrets that water held! The toxic sediment harbored centuries of yearning: the yearning of Indian oyster-catchers, Dutch colonists, American revolutionaries, men who toiled on its banks and men who perished in its depths. For centuries, we have been drawn to that water. And though the water is unclean, we are drawn to it still. ■



## NORTHERN BITES

# Noma made Copenhagen a restaurant hub, but now all of Denmark is a foodie draw

**JUST UNDER A MILE** out onto the mucky sand of the Wadden Sea's tidal flats, Jesper Voss straps on his apron. Made of thick leather and heavy with buckles, hooks and other hardware, it makes him look a little like a gladiator. But the blade he pulls from a chest pocket does not appear especially menacing, nor, for that matter, does the bottle of Tabasco he keeps in another. "Here," he says, sliding the knife into a shell that minutes earlier was protruding from the sand. "Freshest oyster you'll ever eat."

Four or five days a week, Voss leads tourists—50 or 60 a month—on an oyster safari, collecting bivalves from the sands of Fano, a windswept island in southwestern Denmark. The 51-year-old Voss spent most of his career at a human resources company but is now the self-proclaimed "Oyster King." Voss's career change says a lot about contemporary Denmark and its transformed food culture. Not long ago, Danish cuisine—such as it was—consisted mainly of fried pork and pickled herring. Now, as people like Voss prove, it is becoming a destination for gastronomic tourism.

Copenhagen has been a place for foodie pilgrimages for several years. Ranked best restaurant in the world four times, chef René Redzepi's Noma, with its exquisite tasting menu featuring reindeer lichen, mahogany clams and wood sorrel, established a style of cooking based on local ingredients that quickly spread to many restaurants there. Several of those, like Relæ, Amass and Bror, have developed international reputations, and these days a full third of all tourists who visit



Copenhagen come with plans to dine at a wish-list restaurant. "The food revolution of Copenhagen has completely changed the Danish economy," says Kasper Fogh Hansen, director of communications for the Food Organization of Denmark.

BY  
**LISA ABEND**  
Twitter: @LisaAbend

**SHUCK AND JIVE:** The Wadden Sea's tidal flats are happy hunting grounds for tourists looking for a tasty oyster safari.

+



KASPER FOIGH

"Denmark has lost 186,000 private-sector jobs since 2008. The only area in which we've had large-scale job creation is restaurants."

It makes sense, then, that Noma's impact is slowly being felt outside the capital. This year, when the Michelin Guide published its first volume dedicated to Nordic cities, Aarhus, Denmark's second largest, had three one-star listings. Coupled with a food festival that draws 30,000 people annually, the Michelin Guide's recognition has encouraged the city to embrace gastronomic tourism, and it recently won the competition for European Region of Gastronomy for 2017. "There is also a lot going on with gastronomy," says Jan Beyer Schmidt-Sorensen, director of business development for Aarhus. "And as a young and growing city, we can't deny that *gastronomic* is a label that a lot of people want."

That's a lesson others are learning. The Danish island of Bornholm has positioned itself as a gourmet destination for foodies with farm shops, a local brewery, artisanal ice cream parlors that flavor their offerings with island-grown herbs and berries, and a cooking contest that each year draws some of the country's best chefs. It doesn't hurt that one of the finest restaurants in the country, Kadeau, is there. Nor did it hurt Henne, a tiny town on the other side of the country, when Paul Cunningham, who earned a Michelin star for his cooking at the Paul restaurant in Copenhagen, took over the kitchen of a small inn there in 2012.

Aaron and Diana Arizpe understand why. Both young Danes work in the food industry—he as a food writer, she as a cooking teacher—so when it came time to pick a honeymoon destination this past summer, Copenhagen was the obvious choice. But they also ventured far outside the capital, driving to the otherwise unremarkable city of Odense to eat at Sortebro Kro, because Diana had gotten to know the chef, John Pedersen, via social media. There, they delighted in his classically Danish menu of pickled herring and meats cooked on the bone. But they loved Cunningham's Henne Kirkeby even more. "Cunningham came over with a bowl of potato chips tossed with tons of herbs and flowers, and 'Let's get this shit out of the way right now' were his first words to us, taking a jab at the way other chefs in Denmark tend to garnish food these days," Aaron says. "It was a great icebreaker. And the food? Well, I love Noma and will always love Noma, but Diana and I both thought that

this was the best meal of the trip!"

That's not to say there aren't gastronomic challenges to striking out into the wilder parts of the Jutland peninsula. Because Denmark does not have a strong culinary history, traveling in rural areas doesn't offer the density of gourmand pleasures of, say, Tuscany or the Basque countryside. "There are a small number of excellent eateries up and down the coast of Denmark," says Henrik Halkier, professor of tourism studies at Aalborg University. "But they are dispersed. That's the challenge. If you are someone who travels to eat, and you find yourself in a small town with your stomach rumbling, chances are you're not going

## DENMARK HAS LOST 186,000 PRIVATE-SECTOR JOBS SINCE 2008. THE ONLY AREA IN WHICH WE'VE HAD LARGE-SCALE JOB CREATION IS RESTAURANTS."

to find the kind of quality you'd like. Chances are you're going to find a brown kitchen [the Danish equivalent of a diner] where everything is the color of deep-fried fish."

But if a critical mass of good food has not yet been reached in the hinterlands, Danes themselves are at least starting to look for it. For the past five years, visitors from Copenhagen and Aarhus have been wading into the chilly waters of a sound called Limfjorden to hunt the indigenous and rare European flat-shelled oysters that some consider the best in the world. And in Fano, chef Jakob Sullestad, who owns the charming Sonderho inn, has noticed that a growing number of Danish guests have questions about the provenance of their dinner. "They'll ask specifically, 'Is the lamb local? Is it from Fano?'" he says. "They want to know if our herbs are wild."

That's a trend the Oyster King has noticed as well. One of his tours takes about three hours and includes plenty of white wine to go with the shellfish bonanza. "Over 50 percent of my clients have never tasted oysters before," he says. "But they know that they want to eat what is local and natural. They want to find their own food and eat what is outside their front door. "He paused to crack open another shell. "That," he said as he slurped down the contents, "is the Noma effect." ■



THE CURATED LIFE

## SHOTGUN VETTING

The Italian manufacturer Beretta has invested hundreds of years making exquisite firearms

WE ARE NOW IN the middle of shooting season in Europe, although it seems to me that I have been slap-bang in the middle of shooting season for the last couple of years because I have been researching a book about Beretta. The Italian gunmaker, founded in 1526, may be best known for its side-arms, but it's the sporting guns—shotguns and rifles—that have been mainly occupying me.

In the course of writing this book, I have traveled to parts of the globe and experienced things new to me. I have been to the remote pine forests of Finland to learn about moose shooting and to visit the birthplace of the famous Sako hunting rifle. I have visited Colorado in the depths of winter to inspect an optics factory. I have learned a little about Tennessee mules and peach cobbler while hunting quail amid the telephone-pole-straight pines of Georgia. I have attended the Safari Club International hunting convention in Las Vegas, where I have seen taxidermy truly epic in scale. I have gone to Argentina and witnessed the unforgettable sight of a giant flock of doves rising off a vast field of sunflowers.

If, in reading the above paragraph, I come across as a Hemingway in training, then I apologize. Nothing could be further from the truth. Even by the most elastic stretch of the imagination, I am no outdoorsman. To me, the shotgun is of value and interest more as a cultural object than as a weapon. I am not talking about shotguns with synthetic stocks, semi-automatic loading systems

and camouflage paint jobs, practical though those innovations may be for the hunter. What interests me is the world of aesthetic references and ritual that has built up around what is, *au fond*, a very simple, traditional object.

The masters of numerous disciplines are involved in the making of a shotgun; forging a barrel, for example, is a matter of precision engineering. Barrel lengths, internal geometry and other scientific variables obsess the keen shot as much as the minutiae of car engines concern the petrol-head. In particular, I find myself more drawn to the magic of skills that hover somewhere between art and craft, transforming the raw materials of wood and metal into items of rarity and beauty.

I marvel at those who have developed the talent of looking at a chunk of walnut and judging how to balance the decorative effect of the grain with the functional requirements. That strikes me as similar to the skills of a diamond cutter whose practiced eye can see stones big and small inside one single rough diamond.

I particularly love the engraving studio at Beretta, where the air is alive with the music of tiny hammer blows upon burins, each delicate chime signifying a step along the road of transformation that brings the plain metal of the action to sparkling life, covering it with everything from abstract geometric patterns to narrative scenes taken from the natural world. One salutes the steadiness of hand as much as the patience

BY  
**NICHOLAS FOULKES**



**BANG ON:** The engraving on a Beretta shotgun can be so meticulous that it requires hundreds of hours of work by a craftsman.

required; an engraver might work for 800 hours on just a few square centimeters of metal.

Even the application of checkering to the wood of the stock and the fore-end is an artisanal craft all its own, and the skills employed have not changed in generations, even if the patterns have. Today's functional, grip-enhancing patterns—think of the impression of a meat tenderizer in miniature—pale beside the elaborate work of the past, which recalls the effect of tartan transposed onto wood.

I see a great many parallels between mechanical watches and shotguns. Like the mechanical watch, the shotgun functions according to principles unchanged for generations and is a mechanical object with which, through use and familiarity, one develops an emotional relationship. Just as a cherished timepiece becomes a vessel for linking the old with the young and the dead with the living, so a fine gun can be another of these secular sacerdotal objects passed down from generation to generation. There is still a certain ancestral chic in Britain about shooting with a pair of paternal (or indeed grandpaternal) Purdeys or Hollands.

I AM DRAWN TO THE MAGIC OF SKILLS THAT TRANSFORM WOOD AND METAL INTO ITEMS OF RARITY AND BEAUTY.

And that is another marvel—such is the level of simplicity and perfection in the manufacture of such guns that they continue to work long after their first owner has departed. Even though I am not of a technical bent, I can just about grasp how a gun works: The interaction of mechanical components cause a controlled detonation of the propellant, expelling the projectile from the barrel. In a complex digital world, in which we operate objects without any clear idea of how exactly they function, there is something remarkably reassuring about an analog item made with screws and springs, wood and metal. □

# REWIND

25  
YEARS



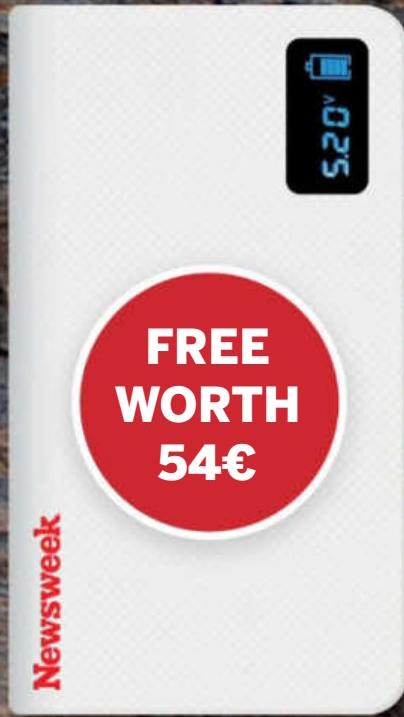
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QUOTING MOLLY LAZAR, A CHICAGO WOMAN WHO PAID FOR HER OWN MAMMOGRAMS EVERY OTHER YEAR WHEN HER INSURANCE COMPANY DIDN'T COVER THEM, IN "THE POLITICS OF BREAST CANCER" BY MELINDA BECK

"If you could do a mammogram on the testes—a testogram—you'd be goddamn

sure that men would be having them every year and that insurance would pay,' Lazar says angrily. 'The insurance companies are run by men. It's shameful.'

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